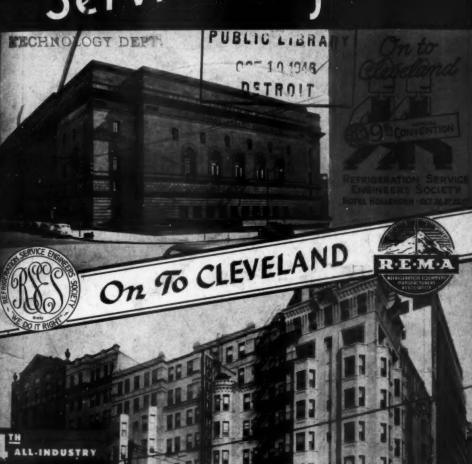
Refrigeration Service Engineer



ONVENTION CLEVELAND

PERFECT BALANCE

Will see

Will see

Wanth

at 8002

Chicago Seals

MODERN DESIGN

CHICAGO SEAL CO.

20 North Wacker Drive

Chicago 6, Illinois

THE REFRIGERATION SERVICE ENGINEER, Nickerson & Collins Co., Publishers. 435 N. Waller Ave., Chicago 44, Ill Published montaky, Vol. 14, No. 10, October. 1946, Entered as second class matter March 4, 1938, Chicago, Ill., under the Act of March 3, 1879. Subscription in the United States, \$3.00 per year; all other countries, \$3.00 per year.

KNOW YOUR REFRIGERANT CORROSION LIMITS

EFFECTS OF MOISTURE

Moisture in a refrigerating system may cause any or all of the follow-

- 1. Freezing up at expansion valve or capillary tube, ice in the evaporators.
- 2. Corrosion of metals to form
- 3. Copper Plating.

RESULTS OF TESTS CONDUCTED ON STEEL

Refrigerant	% Water by Weight	Results
Sulfur Dioxide	0.03 0.10 0.15	Slight discoloration Slight scale Heavy scale Presence of air did not affect results
Methyl Chloride	0.02 0.03 0.05	Stight discoloration Marked discoloration Very slight scale Moderate to heavy scale Presence of air increased corrosion in all cases
"Freon-12"		Similar to methyl chloride

FACTS REVEALED

- 1. Corrosion of metals occurs whenever the amount of water present exceeds fairly well defined limits.
- Water reacts with sulfur dioxide, methyl chloride, "Freon-12" and other refrigerants to form acids.
- 3. These acids react with steel, copper, and aluminum parts of a refrigerating system to form definite metallic salts (sludges).
- 4. In a sulfur dioxide system the amount of moisture tolerable is higher than in a methyl chloride or "Freon-12" system but corrosion, once begun, proceeds more rapidly in a sulfur dioxide system.
- 5. Corrosion in a butane or isobutane system is due to the direct action of the water and perhaps air, on metals.
- 6. Moisture tolerances are higher for copperbrass and aluminum than for steel.



- 7. Moisture tolerances are lower at higher temperatures found in condenser and compressor than at room temperature.
- 8. Corrosion is much worse in the presence of air in all refrigerants except sulfur dioxide.
- 9. Approximately 90% of the sludges produced in refrigerating systems are due to moisture: the others are associated with oil and minor causes.



SEND FOR THIS BULLETIN
An informative reprint, "MOISTURE and
DRYING METHODS," will be sent on
request. No obligation. Send for it today. ANSUL WHOLESALERS are ready and equipped to render an intelligent, co-operative service to refrigeration engineers and maintenance men on problems which arise from time-to-time in the operation of refrigerating systems.

ANSUL REFRIGERANTS ARE AVAILABLE AT LEADING WHOLESALERS EVERYWHERE

REFRIGERATION DIVISION, MARINETTE, WISCONSIN

FOR KINETIC'S FREON 11



2187

Demands on expansion valves vary widely. Capacities, suction temperatures, condensing temperatures, refrigerants, types of service, etc., produce countless combinations. No one valve will satisfy all these conditions. The "Detroit" No. 673 successfully meets the requirements of most commercial installations, and is "the standard of the refrigeration industry."

The "Detroit" line includes a large number of valves of different capacities and characteristics, because only in this way can every refrigeration condition be met. The line includes, for example, a special valve used only for temperatures from below minus 30 deg F down to minus 120 deg F. Ordinary expansion valves are entirely unsatisfactory in such ranges. Also, we offer valves especially recommended for the high ranges encountered in comfort air conditioning. Between these extremes are found the big bulk of refrigeration installations—com-

mercial, industrial, etc. But conditions encountered here vary widely, so a number of valves are offered.

18 Methyl.

SHOULD DISC.

Methyl.

Of course, we are not telling the refrigeration man anything new when we say that selection of the proper valve for the job is of prime importance in the success of the job. Ordinarily, his experience will tell him what valve to use. But jobs turn up continually which do not conform to regular experience. In such cases it is worth while to make use of Detroit's very large collective refrigeration engineering experience. We have been designing and making valves for many years and have, at some time, encountered about everything refrigeration has to offer. This collective experience is available to you through your wholesaler. If he hasn't the answer in his own experience, or in his files, he can get it for you.

SIDE OUTLET STRAINER



REPLACEMENT OF FILTER EASILY MADE

The Mueller Brass Co. Side Outlet Strainer and Filter permits the removal and the replacement of filter or strainer cartridge, without disturbing the line connections.

In changing the cartridge, it is necessary only to remove the cap screws which hold the head firmly in position, then remove the old cartridge and replace with new. In operation, a tight seal is constantly maintained.

A coil spring provides constant pressure against end of cartridge which prevents by-passing of refrigerant between outside of cartridge and inner surface of shell. Cartridges are furnished in two types. The strainer type, which is made from 100 mesh bronze screen, and the filter type, which is equipped with an asbestos sack. Both types are protected by two brass strips that run the full length of the cartridge.

The ends are made from heavy brass forgings that are soldered to the shell which is made from hard drawn copper pipe.

The entire assembly is polished and lacquered after fabrication, giving it a neat and workmanlike appearance. ORDER THROUGH YOUR JOBBER.

MUELLER BRASS CO.



Copeland
DEPENDABLE SAMPLE FRIE RATION
USES

NUTELLEE BRASS CO. PARTS ON ALL MODELS

COPELAND REPRIGERATION CORPORATION SIDNEY, 0410

OPEN-TYPE UNITS

Copeland belt-driven units have an enviable reputation for dependable performance. Models range from 1/6 H. P. to 7-1/2 H. P. inclusive. They incorporate outstanding seal, suction valve, discharge valve and other design features developed throughout Copeland's 28 years of exclusive refrigeration experience. The model illustrated is a 1/3 H. P. remote type.

COPELAMETIC UNITS

TheseACCESSIBLE HERMETICS are the ideal refrigeration for "package" equipment. No belt! No seal! No manual oiling required! Copelametic combines all the good features of welded-in hermetics and open-type units. The design is field-proven by over 100,000 units in service. Sizes range from 1/20 H. P. to 3/4 H. P. inclusive. The model illustrated is a 1/4 H. P. self-contained type.

THESE PRODUCTS



MUST BE GOOD!

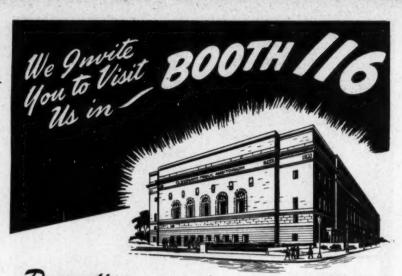
Illustrated on the left hand side of this page are some of the valves and fiftings manufactured by the Mueller Brass Co. of Port Huron, Michigan, that are used on the Copeland Units Illustrated above.

Mueller Brass Co. of Porf Huron, Michigan, that are used on the Copeland Units illustrated above. Mueller Brass Co. Valves, Filhings and Accessories for mechanical refrigeration have a wall-servine formance. They are manufactured specifically for mechanical refrigeration work. THEY ARE USED BY ALL OF THE LARGEST MANUFACTURERS THROUGHOUT THE UNITED STATES. Mueller Brass Co. products must be sood!

Products must be good!

We, at Mueller Bress Co., are proud of our contributions to the dependability and operating efficiency of Copeland Units, known and enthusiastically used the world over.

MUELLER BRASS CO.



Presenting
VIRGINIA REFRIGERANTS
for food Preservation

PUBLIC AUDITORIUM



SEE YOUR JOBBER

IMPERIAL

NO SPRINGS

"EITHER-WAY" FLOW

Imperial leads again with a major advance in refrigeration valve design. The DiaSeal is a diaphragm valve built along entirely new principles—offers outstanding superiorities in performance. Proved and tested both in the laboratory and in the field. Note its advantages;

- 1. NO SPRINGS—Direct lift provides positive control with flow in either direction.
- 2. ONLY TWO MOVING PARTS Simple construction assures greater dependability.
- EASY FINGER-TIP ACTION Quick, sure opening and closing with less than two turns of handle.
- 4. LONG LIFE DIAPHRAGM is impervious to all common refrigerants. In actual tests, has withstood over 1,000,000 openings and closings under refrigerant pressure.
- 5. INLET AND OUTLET PORTS IN LINE. Simplifies installation.

Both internal parts of the DiaSeal lift out with the bonnet, facilitating soldering in line. Extremely low height cuts installation space.

Furnished in a 2-way and angle types, with either flare or solder connections. The Imperial Triple-Seal Groove is an added feature on flare connections 3/8" and larger.

THE IMPERIAL BRASS MFG. CO. 534 South Racine Avenue, Chicago 7, Illinois

FITTINGS • VALVES • FILTERS • FLOATS • DEHYDRATORS • CHARGING LINES • TOOLS FOR CUTTING, FLAR-ING, BENDING, PINCH-OFF AND SWEDGING



The Low-Temp Patrolmen!

THAWZONE and TRACE are two "musts" in protecting refrigeration systems and keeping them functioning perfectly with the minimum of attention.

THAWZONE, in new, reconditioned or old systems, has a two-fold purpose: (1) To destroy moisture already present and causing trouble, (2) as a safeguard against future trouble in systems now functioning satisfactorily. THAW-

ZONE also removes other troublecausing elements such as oxygen (air) and acids.

TRACE spots leaks . . . present or future. Its vivid stay-red color indicates them plainly. Add it to any refrigeration system and be ready for the red signal.

See us at the
4TH ALL-INDUSTRY
REFRIGERATION AND
AIR-CONDITIONING
EXPOSITION
Booth 122

CLEVELAND OCT. 29 TO NOV. 1

HIGHSIDE CHEMICALS COMPANY

195 VERONA AVE.

NEWARK 4, N. J.

SEE THESE WENRY PRODUCTS

At the all-industry REFRIGERATION and AIR-CONDITIONING EXPOSITION*

pressure regulators
w check valves * New
leadings * * * New



*Booth 227, Close October 29—No





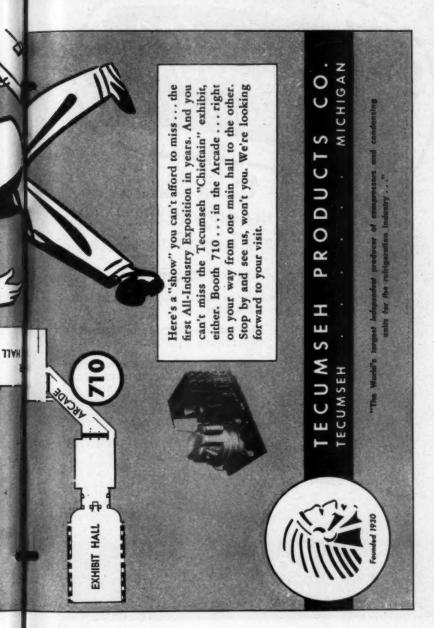
HENR

YOU'LL FIND THE

Chieftain

exHIBIT at BOOTH 7/10

All-Industry REFRIGERATION and AIR-CONDITIONING EXPOSI-TION, Cleveland Public Auditorium, October 29—November 1



Silterpure FOR REACH-INS with AIR PURIFICATION

Combining many exclusive BETZ improvements

- * BETZ COIL CONSTRUCTION
- * CENTRIFUGAL BLOWER AIR CIR-CULATION
- * VERTICAL AIR DISCHARGE THROUGH CONCEALED DRIP PAN
- * COIL AND AIR CIRCULATION SCI-ENTIFICALLY BALANCED TO PROVIDE HUMIDITY IN EXCESS OF 85% AT 35° BOX TEMPERATURE
- * COMPLETE AIR PURIFICATION
- * STREAMLINE CABINET FABRICATED FROM RUST-PROOFED STEEL
- + BAKED ENAMEL FINISH

Sold By Leading Refrigeration Wholesalers

BETZ CORPORATION

"See You at the Show!"

Space 702 - 704 Covered Public Auditorium



· Curtains will be flung wide! Miss Peerless wants to meet you. She's holding your tickets for the showing of PEERLESS products at the Fourth All-Industry Refrigeration and Air Conditioning Exposition October 29 to November 1 in Cleveland. Dan't miss the PEERLESS SHOW! We have information to give you about tremendous develop-ments made in the PEERLESS line of equipment. Get the facts on why it's superior, facts you can use to get a good share of the business ahead. PEERLESS will have NEW 1947 PRODUCTS on display. Enough said! This is the show to put down as e "must see" on your list.





KEROTEST



HELPFUL ADVICE

Your KEROTEST Wholesaler is ready to offer sound, constructive help on any Air Conditioning or Refrigeration valve or fitting problem.



LATEST DEVELOPMENTS

Your KEROTEST Wholesaler is well informed, in advance, on all new developments, new products and new methods of application.



TECHNICAL KNOWLEDGE

Tour KENOTEST Wholesaler has la long years of experience and splesh technical knowledge that covers ewo phase of the industry.



AMPLE STOCKS

Your KENCTEST Wholesaler carries large diversified stocks—and can quickly obtain special items to meet the most urgent emergency.



EFFICIENT PERSONNEL

Your KEROTEST Wholesaler has a staff of well trained men—to provide prompt, efficient service and intelligent information.



QUICK DELIVERY

Your KEROTEST Wholesaler provide quick, systematic delivery servicethat the most remote spot is general only hours away.

Be sure to visit KIROTIST BOOTHS 224 and 226.

KEROTEST MANUFACTURING CO

W YORK

HICAGO .

HOUSTON

LOS AND



... you can sell TEMPRITE draught beer coolers in EVERY SEASON!

Summer, winter, spring or fall . . . every season is the right season to push the sale of Temprite draught beer coolers! DON'T MISS the profit possibilities in Temprite coolers just because the weather cools off. Draught beer is always in demand in EVERY SEASON.

Temprite units are ideal for both reconditioning (where the condensing unit is available) or new installations.

Immediate delivery—Catalog available

















80 1 Liquid Cooling Devices

PIQUETTE AVENUE

DETROIT 2, MICHIGAN

SERVICE ENGINEER

15

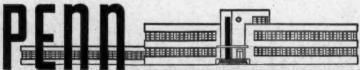
October, 1946



He's Doubly Sure . . . with a PENN!

No faulty water valve imperils his refrigeration installation. This service engineer uses a PENN—the water valve that's different and better. Consequently, rust, corrosion and sedimentation pose no problem. In a PENN valve, the range spring and sliding parts are never submerged in water. Long life and dependable performance are assured.

Get all the facts on this new type water regulator. It's built in two styles—flanged and threaded —in a wide range of sizes to fit your specific need. Write for Bulletin R-1986A. There is no obligation. Penn Electric Switch Co., Goshen, Ind. Export Division: 13 E. 40th St., New York 16, U.S.A. In Canada: Penn Controls, Ltd., Toronto, Ont.



AUTOMATIC CONTROLS

FOR HEATING, REFRIGERATION, AIR CONDITIONING, ENGINES, PUMPS AND AIR COMPRESSORS

NU-COIL

Reg. U. S. Pat. Off

SCALE SOLVENT

OFFERS IMMEDIATE RELIEF TO REFRIGERATOR EQUIPMENT WITH LOW EFFICIENCY AND HIGH OPERATING COST. NUCOIL RESULTS ARE SURPRISINGLY LOW IN COST AND OFTEN THE SAVING IN ELECTRIC CURRENT ALONE PAYS FOR THE DESCALING OF COILS.



FOR

CONDENSER COILS

REFRIGERATOR DRAINS

UNIT COOLERS

SPRAY HEADS

VALVE PLATES

CONTROL VALVES

STUCK COMPRESSORS

EVAPORATOR FINS

WATER COOLERS

YOUR WHOLESALER WILL SUPPLY NU-COIL SKASOL CORPORATION

112 Glencoe Ave.

Webster Groves 19, Mo.

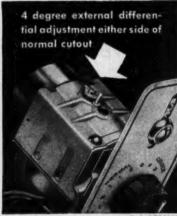
SERVICE ENGINEER

17

October, 1946

The Cutier-Hammer Line of REFRIGERATION REPLACEMENT CONTROL

This One Universal unit alone covers 60% of all needs.



Bul. 9521N9

Adjustable Mounting Brackets

Maximum Mounting Centers......4-3/16
Minimum Mounting Centers......2-3/16

Adjustable Cutout Feature—Differential can be increased 4 degrees by turning indicator in "Hi" direction and decreased 4 degrees by turning in "Lo"

Adjustable Range—Turning screw clockwise lowers settings and counter-clockwise raises settings.

Operating knob can be adjusted to meet various evaporator scale settings. New knob is ideal for vary-ing shield thicknesses. Makes this control adaptable to wider range of single dial replacement jobs where overload is not required in unit.

Visit our booth No. 304-306, Refrigeration as Air Conditioning Exposition, Cleveland Public Auditorium, October 29-November 1



The Cutler-Hammer line of Refrigeration Replacement Control will meet all the refrigeration serviceman's requirements. One Cutler-Hammer Control Unit alone . . . the Universal Replacement unit . . . will handle 60% of his needs. And where exact replacement control is needed, that item also will be found in the C-H Exact Replacement Control line . . . individually packed, clearly labelled, complete with dial plate, mounting screws, trim washers and full instructions for mounting and adjustment.

Behind this line are 50 years of control specialization and thorough knowledge of merchandising requirements. Thus, the line is recommended by outstanding refrigeration wholesalers from coast to coast and alert service organizations everywhere use it to reduce investment in stock, to insure regular and rapid turnover, faster completion of the job, and greater all-round satisfaction. CUTLER-HAMMER, Inc., 1363 St. Paul Ave., Milwaukee 1, Wisconsin.



DOMESTIC, SEMI-COMMERCIAL AND COMMERCIAL CONTROL



TO THE ALCO VALVE EXHIBIT

The entire sales and engineering staff of Alco Valve Company will be in Cleveland to welcome their friends in the Industry. We look forward to meeting all the new members of the Industry. Come right in and make yourself at home.

We will show our standard products and many completely new controls. We will be glad to discuss any of your problems with you.

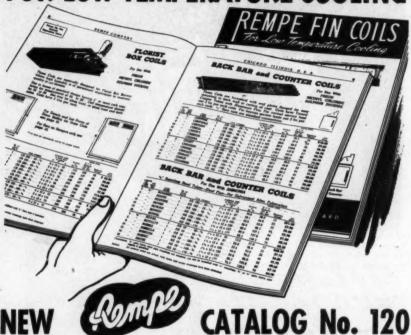
See you in Cleveland!

Designers and Manufacturers of Thermostatic Expansion Valves; Pressure Regulating Valves; Solenaid Valves; Float Valves: Float Switches.



857 KINGSLAND AVE. . ST. LOUIS 5, MO.

To Help You Select Fin Coils FOR LOW TEMPERATURE COOLING



With Complete Data on

- FIN COILS for √ Walk-in-Coolers
- √ Display Cases
- **V** Florist Boxes
- \vee Back Bar Coolers

for use with Ammonia, Freen, Methyl, or Sulphur You'll find a great wealth of practical and helpful information in this Rempe Catalog #120 on Fin Coils for Low Temperature Cooling. Pertinent information is given on How to order—Overall Coil dimensions—sq. ft. of surface—B. T. U. Capacity—Size and type of coil to be used in various refrigerators and Display cases.

Write today for your copy

REMPE COMPANY
358 No. Sacramento Blvd., Chicago 12, III.

October, 1946

20

THE REFRIGERATION

Brunner Refrigeration helps you serve better

IF HEAD PRESSURE IS TOO LOW

The Brunner Refrigeration Service Manual gives the following possible causes and remedies:

PROBABLE CAUSE

TEST and REMEDY

Lack of refrigerant:

Leaking compressor suction and discharge valves or broken discharge valve:

Safety relief valve from discharge to low pressure side of system has opened and not reseated properly:

Very cold room or using very cold water:

If oil separator used, there is possibility that float may stick open and blow-by from discharge to suction may result: Locate leak and recharge.

Check compressor and replace or repair valves.

Open relief valve and lap seat to close and seal tightly.

If due to cold room or cold water, this is an advantage and gives greater capacity and lower power costs.

Open separator and free float or replace.



THE primary essentials of service are common to all refrigeration systems. Fundamentals, such as those given above, are emphasized in the Brunner Service Manual so that the basic installation and maintenance advice given will apply to the various refrigeration systems. When trouble shooting, you will find the Brunner Service Manual an invaluable aid. If you don't have one, a copy will be sent for only \$2.50. Write to:



For more than 40 years the Symbol of Quality

BRUNNER MANUFACTURING CO., UTICA 1, N.Y., U.S.A.



See the new OASIS on display at the EBCO Booth 201

4th All-Industry Refrigeration and Air Conditioning Exposition
Public Auditorium • Cleveland, Ohio • Oct. 29 to Nov. 1



Weigh PAR Performance and Construction, Feature by Feature ... you'll find PAR gives Dependable Economical SERVICE PLUS!

PAR BY Lynch

MANY of the outstanding features built into every Par Condensing Unit are exclusive with Par. Features that give plus values in construction, performance and service. Weigh them—one by one, and see for yourself why Par tips the scales on Service Plus.



See your Par Jobber today —or write for Par Refrigcration Catalog R-97.



PAR—Condensing Unit Line sold exclusively through Franchised Refrigeration Equipment Wholesalers!

Lynch

. . By Comparison - You'll Buy PAR

Manufacturing Corporation
TOLEDO 1, OHIO, U.S.A.

SERVICE ENGINEER

23

October, 1946



Have fun, friends—we intend to—but stop in and see us in between times.

We will be in booths 324-326 during the three-day show in Cleveland Public Auditorium.

Ranco Inc.

COLUMBUS 1, OHIO

THE REFRIGERATION SERVICE ENGINEER

The
National Magazine
of
Refrigeration
Sales, Service
and Installation

Published Monthly by

Nickerson & Collins Co. 433-435 North Waller Ave. Chicago 44

Telephones Austin 1303-1304-1305

Publishers of Technical Boeks and Trade Journals Serving the Refrigeration Industries for over 50 years.

H. T. McDermoit, President H. T. Curtis, Vice President L. R. Townsley, Sec.-Treas.

H. T. McDermott
Editor and Publisher
H. D. Busby, Managing Editor
Associate Editors
EMBRSON A. BRANDT
E. R. CURRY

L. R. TOWNSLEY, General Mgr. HELEN G. SMITH, Asst. Mgr. A. M. WILLCOX, Eastern Mgr.

Advertising

R. L. HENDRICKSON EDW. DAVIESON BERNARD E. NEARY

Official Organ
REFRIGERATION SERVICE
ENGINEERS SOCIETY

EASTERN OFFICE
420 Lexington Ave., New York 17
Telephone Lexington 2-4735
Subscription Rates United States
\$2.00 per year. Single copies 25c
All other countries \$5.00 per year

Copyright, 1946 by Nickerson & Collins Co., Chicago, 44 Vol. 14 OCTOBER, 1946 No. 10

Contents

Cleveland Host to the Industry27	
The Opportunity for the Serviceman in Mobile	
Refrigeration29	
Getting Down to Business-by Waylan Clarke34	
Service Firms Make Early Start Selling Winter Service —by Herbert Hanley	
Problems in the Use of Water Cooled Condensers —by Ralph M. Westcott	
Measuring the Output of an Air Conditioner —by Edward Dowis	
Questions and Answers:	
Correction	
Banana Ripening47	
Grunow Evaporators ,47	
Frigidaire Sticks Up47	
Florist Box48	
Service Pointers:	
Hostess Adapter49	
\$125.00 Mouse Trap49	
Light and Fan Switch50	
Repairing Superfex50	
Drilling Glass50	
On to Cleveland, Says R.S.E.S	
4th All-Industry Refrigeration and Air Conditioning	
Exposition60	
REWA Ready for Cleveland62	
National Assn. of Refrigeration Contractors64	
Frozen Food Mfgrs. and Suppliers Assn	
National Frozen Food Locker Assn	
Exhibitors and What They Will Display68	
Cylinder Shortage Is Refrigerant Bottleneck76	
R.S.E.S. News:	
Iowa State Assn. Formed78	
Chapter Notes	
Educational Film Schedule84	
Wholesalers and Retailers Formulas	
Ceiling on New 1946 Domestics	
Production for July	
New and Improved Appliances90	
News of the Industry94	



CLEVELAND should experience a real Fall chill October 26th through November 1, as thousands interested in every phase of refrigeration converge upon this industrial center for industry association meetings and the All-Industry Refrigeration and Air Conditioning Exposition.

WHO THEY ARE . WHERE THEY MEET







REFRIGERATION SERVICE ENGINEERS SOCIETY

Headquarters—Hollenden Hotel
OCTOBER 26TH THROUGH
OCTOBER 29TH



REFRIGERATION EQUIPMENT WHOLE-SALERS ASSOCIATION

Headquarters—Hotel Statler october 28th through November 1

FROZEN FOOD LOCKER MANUFACTURERS & SUPPLIERS ASSN.

Allerton and Carter Hotels
Co-sponsor All-Industry Refrigeration & Air Conditioning Exhibit
OCTOBER 29 THROUGH NOVEMBER 1

REFRIGERATION EQUIPMENT MANUFACTURERS ASSN.

Headquarters— Hotel Cleveland Sponsor—All-Industry Refrigeration & Air Conditioning Exhibit OCTOBER 29TH THROUGH NOVEMBER 1



NATIONAL ASSN. OF REFRIGERATION CONTRACTORS

Headquarters—Allerton Hotel october 27th through october 29th

NATIONAL FROZEN FOOD LOCKER ASSN.

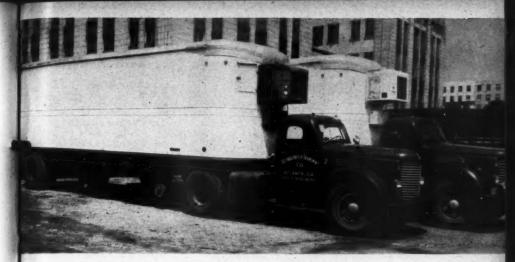
Allerton and Carter Hotels october 29th Through NOVEMBER 1

PEAK PERFORMANCE THERMOSTATIC EXPANSION VALVES SOLENOID VALVES • SOLENOID PILOT CONTROLS • MODULATING PILOT CONTROLS • REFRIGERANT DISTRIBUTORS • STRAINERS PEAK PERFORMANCE THERMOSTATIC EXPANSION VALVES SOLENOID PILOT CONTROLS - MODULATING 5 MERIGERANT DISTRIBUTORS • STRAINERS SPORLA THERMOSTATIC EXPANSION VALVES SOLENOID PILOT CONTROL MODULATING CONTROLS VISTRIBUTORS SPORLAN VALVES INVITES YOU TO VISIT RMOSTATIC CONTROLS SOLENOID A BOOTH 431-433 PILOT CONT STRAINERS PEAK PERFO N VALVES at the ALL INDUSTRY SOLENOID VAI DULATING REFRIGERATION RAINERS PILOT CONTRO AND AIR-CONDITIONING VALVES PEAK PERFORM LATING SOLENOID VALVI EXPOSITION **\INERS** PILOT CONTROL CLEVELAND PEAK PERFORMA ALVES PUBLIC AUDITORIUM SOLENOID VALVES TING OCT. 29th . NOV. 1st 1946

1946

1946

REAT INDUSTRY'S GREATEST EVENT PILOT CONTROLS . **IERS** PEAK PERFORMAN VES SOLENOID VALVES - S VG PILOT CONTROLS • R 25 PEAK PERFORMANCE VALVES SOLENOID VALVES • SOL .. KULS . MODULATING PEAK PERFORMANCE THERMOSTATIC EXPANSION VALVES SOLENOID VALVES • SOLENOID PILOT CONTROLS • MODULATING PILOT CCT PIERS PEAK PER-SOLENOID VALVES • SOLENOID PILOT CONTROLS • MODULATING PILOT CONTROLS • REFRIGERANT DISTRIBUTORS • STRAINERS



Typical type of refrigerated interstate transport Thermal unit is mounted on nose of trailer.

The Opportunity for Servicemen in

Mobile Refrigeration

N UNPRECEDENTED boom in frozen A foods and a demand for larger and more modern facilities for transporting fresh foods of all descriptions is placing a severe strain on present shipping facilities. The manufacture of thousands of mechanically refrigerated trucks and trailers is needed to meet present demands in what may well become the greatest era of expansion in the history of the transport industry.

The increase in frozen foods alone will create a big demand on refrigerated trucks. Based on the increase of 520 per cent in the consumption of frozen foods from 1936 to 1943, economists predict that within 10 years the volume of frozen foods sales will reach 11 billion dollars per year with 65% of all perishable pre-

served by freezing.

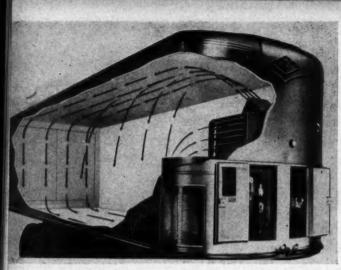
They point out that there are now more than 300 concerns in the United States, packing frozen foods with more than 40,000 retail stores selling them. Held back by wartime shortages of equipment, the frozen food industry is expected to expand rapidly as equipment becomes available. Hundreds of stores are planning to add lines of frozen foods and others are planning expansion of

Expanding applications of refrigeration equipment forecast the future possibilities for the service engineer. Low temperature refrigerated transport service is one of many fields offering future possibilities.

their frozen food departments. The number of locker plants is now approaching 7,000 and the total increases almost daily.

For the motor transport industry, every food processing plant, every retail store, every locker plant, almost every step dealing with the transport of fresh or frozen foods, provide potential customers

for "refrigerator" hauling services. At the close of 1941 there were 27,100 refrigerated trucks in service in the United States, only a fraction of one per cent of the total amount of trucks with direct mounted bodies. In the trailer classification there were about 4,700 refrigerated vehicles, about 4 per cent of the total in operation in the United States.



Diagrammatic drawing showing how the Trail-Aire conditioner circulates air through the body of the trailer at a rate of 1800 cu. ft. per minute. The complete refrigerating system is located in the nose of the trailer and can be removed as a unit for major overhaul or replacement. On the outside nose of the trailer can be seen a dial thermometer which indicates trailer temperatures. The double doors below it are for minor service on the unit and for easy access to valves and controls. The grill on the left front of the trailer is an air intake for the gasoline engine and for the condenser coil.

In the trailer field alone, experts estimate that there is an immediate need for at least 4,000 more refrigerated trailers for the transportation of frozen and perishable foods. The same experts estimate that there is a present market for thousands of refrigerated trucks with direct mounted bodies.

The transport industry, of course, has many problems to meet, one of which is the reduction of weight of equipment which will increase pay loads. Truck and trailer manufacturers are making rapid

gains in this direction by changing designs and by the use of more aluminum and other light weight metals. The refrigeration industry is cooperating by employing new designs and new materials to reduce weights. At the same time, more efficient refrigeration equipment—much of it patterned after the Army's highly successful mobile "reefers" used to haul fresh foods to the fighting fronts—is being combined with better insulation and sealing of the sidewalls, floors and roofs of truck and trailer bodies to give improved refrigerating results for the larger cargoes over longer hauls.

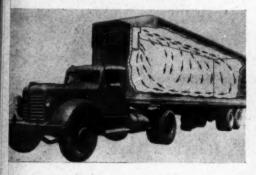
Problems Summarized

Problems in connection with truck transportation of perishables are summarized in a report issued by C. E. Reifsteck, secretary of the Frozen Food Council of Southern California. Mr. Reifsteck compiled his report from data assembled in a conducted survey of refrigerated cargo handling.

The chief concern in the safe delivery of frozen and refrigerated cargoes is the proper maintenance of low temperatures in the cold storage space, his summary pointed out. The rapid increase in frozen foods production and cargo volumes, he explained, is being met by delivery of special bodies as rapidly as manufacturers are able to obtain necessary materials.

Transportation of quick-frozen foods and refrigerated cargoes, according to Relfsteck, will bring extra profits to truckers and shippers if certain funda-

Below is a similar drawing showing Thermo King unit above the tractor cab and on the nose of the trailer. This unit is a self contained, fully automatic gasoline engine driven system weighing less than 750 pounds. It can quickly be removed and replaced for servicing.



mental safeguards are observed to insure

delivery.

He contends that, regardless of the type of carrier, frozen food transport can be successful continually on either short or long hauls only if inside air temperatures are maintained at or under 15° F. The safety range for air temperature inside the truck, except for extremely short intervals, should not exceed 5° F. above that level, and, following such intervals, the cargoes should remain at zero deg. Fahr. sufficiently long to reduce whatever heat may have been picked up.

Above Freezing Cargoes

For unfrozen, refrigerated cargo, the same precautions apply, except that the safety ceiling is 40° F. Perishables which are merely refrigerated, not frozen, present a special problem. Refrigerated foods require not only that the cargo temperature be maintained at sufficiently low levels, but that it be controlled and prevented from falling too low. Slow freezing destroys the texture of meat, fish and fruits and other foodstuffs, such as milk, cream or mayonnaise, are ruined by

freezing of any kind.

Above the freezing point, refrigeration alone is insufficient to preserve most perishables. To accomplish this, proper air circulation must be maintained over the surface of fresh and cured meat. There should be no damp spots or stagnant areas in the air circulating pattern. Where fresh fruits and vegetables are hauled without precooling, the packages must be properly spaced to permit cooling enroute or direct icing must be employed. Reifsteck also urged special attention be given to drains to assure that they are kept open and free of obstructions.

Self Contained Units Needed

This report seems to point directly to greater use of mechanical refrigeration of a self powered, self contained type, particularly where long hauls are involved.

Refrigerated transport may be roughly divided into two classes: (1) Interstate or long hauling which usually employs trailers pulled by truck tractors; (2) Local delivery and short haul which employ both trailers and trucks with direct

mounted bodies.

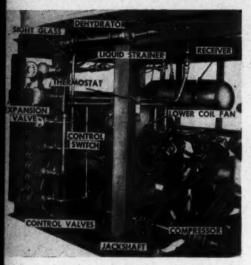
Several arrangements of the refrigerating equipment are used where the hauls are not too long or where the truck is not required to be out of the garage for more than 12 hours at a time. Some of these will be discussed later on. Interstate transport, however, requires a fully automatic self contained and separately



Above is a view of the Oak Grove truck and trailer exterior and interior. This truck is used for hauling milk a distance of 80 miles into the Twin Cities. Loaded with about 29,440 pounds of bottled milk, the trailer makes two trips a day. The gasoline engine driven con-densing unit is mounted under the trailer body. Dole truck plates are mounted on the ceiling of the trailer.

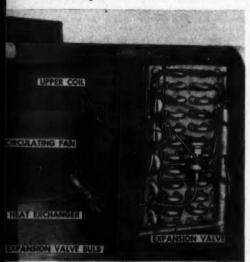
Below is a direct mounted truck body of the National Food Stores using a Thermo King self contained unit. This truck is used mainly for short hauls and city deliveries to branch stores.





The two views on this page show the arrangement of the Trail-Aire unit. In the above view can be seen in line: (1) the jack shaft and betting arrangement, (2) the four cylinder compressor, (3) the condenser fan, and (4) the condenser.

The view below shows the evaporating coil and circulating fan which is mounted above the condensing unit.



powered unit which can be operated independent of the tractor to maintain desired conditions in the trailer for an indefinite time.

The interstate trucking companies are expanding and modernizing their equipment. Many of the new trucks and trailers they will purchase will have adequate refrigerating equipment for either above freezing or below freezing temperatures.

Need Service Stations

One of the major problems confronting them in their expansion is the matter of repair and service. Few of the truck lines can afford to develop their own service organizations and will have to depend upon the independent service organization which may be found in every town or city of 10,000 population or over. This problem of service is a serious matter for the trucking lines and a brand new opportunity for the serviceman.

The routes of the various trucking lines are fairly constant so that service facilities along the route can be located at frequent intervals where prompt and efficient service can be obtained. The service would of necessity have to be on a 24 hour basis because interstate trucks travel at night as well as daytime. Parts could be stocked at the service stations and even spare units for complete replacement in the event of a major breakdown. This complete replacement would be much simplified in the case of the modern packaged type of unit mounted in the nose of the trailer.

Two manufacturers are at present producing completely self contained and fully automatic truck and trailer refrigerating units which seem to indicate the direction this application of refrigeration is taking. One of these is the Trail-Aire made by the Advance Manufacturing Company of Detroit and sold exclusively by the Fruehauf Trailer Company.

Trail-Aire Conditioner

The Trail-Aire unit is installed in Fruehauf Refrigerator Vans, fully insulated for hauling such commodities as ice cream, fruits and vegetables, poultry, meats, frozen foods and dairy products. It is designed to deliver pre-cooled products at the same temperature they are when they go into the unit or at temperatures which can be lowered in transit several degrees, if necessary.

The conditioner is what the name implies, a year-round air conditioner that will either heat or cool the trailer interior, as needed. This is accomplished by reversing the refrigerant cycle.

When the conditioner is being used to cool the trailer interior it functions like any conventional refrigerating machine;

that is, the heat is removed from the interior by the flow of air through the evaporator coil. Air circulation is 1,800

cu. ft. per minute.

When the conditioner is being used to heat the trailer interior, the above process is reversed. By closing 3 hand valves (painted white) and opening 3 hand valves (painted red) the cycle is reversed so that the evaporator functions as a condenser and the condenser becomes an evaporator. To increase the efficiency of the heating cycle, waste heated air from the gasoline engine is utilized as a convenient source of heat so that regardless of the outside temperature the conditioner is an efficient heater. The unit is fully automatic, being thermostatically controlled on both the heating and cooling cycle. Proper insulation of the trailer is essential.

The conditioner is built as one package for removable installation in the nose or front end of the Fruehauf insulated van. This feature allows the unit to be completely assembled and tested in the plant, eliminating any field hook-up or testing. This feature makes it possible for the operator to remove a unit for major servicing or to install a replace-

ment unit.

Easily Serviced

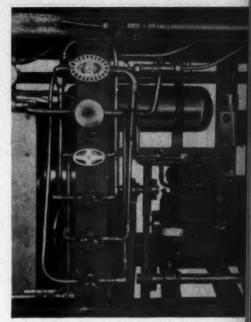
Installed in a protected, out-of-the-way place, the unit is readily accessible for minor servicing through two service doors in the front wall of the trailer; and for semi-major servicing the vertical insulated bulkhead that separates the unit compartment from the trailer interior may be removed to provide access to all components in the compartment. All possible consideration has been given to the design of the conditioner so that it can be serviced with the least possible effort.

The Trail-Aire Conditioner is powered by a 4-cylinder, V-type, air-cooled engine, equipped with automatic choke, battery ignition, 6-volt starter and generator and the necessary relays for full automatic stopping and starting. It is equipped with a high pressure cut-out switch which stops the engine if for some unnatural reason the refrigerant pressure goes beyond normal. This safety device protects the compressor from operating under an overload.

The U. S. Thermo Control Co., of Minneapolis, Minn., is another manufacturer of self contained units for trucks. During the war they made units for 10 ton Army Quartermaster Corps aluminum trailers. These units are available now. A description of them will appear in next month's

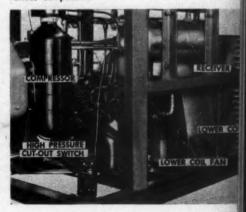
issue of this journal.

(To be continued)



The Trail-Aire unit can be used for both heating and cooling as desired. The upper three of the hand valves shown above are painted white, the lower three painted red. By closing the upper three and opening the lower three the system operates in reverse cycle, supplying heat to the trailer.

The view below is of the left hand side of the condensing unit showing the location of various components.



October, 1946



By WAYLAN CLARKE

fOULD you mind billing me a little later, Mr. Service Man?" asks Mrs. Guff, over whose domestic unit you have perspired lo these four and a half hours. "I simply don't have the cash on hand right this minute and after all, you know I have a budget and Mr. Guff relies on me to spend money carefully and we, and . . ."

On and on gushes Mrs. Guff, but you get the idea quickly enough. Here's "on the-cuff" business staring you in the face and what are you going to do about it? Perhaps this would never have come up had you defined your stand on credit at an earlier point in your business relationship with Mrs. Guff. But then, a service man cannot be expected to think of everything. Or maybe you did think of it, but because it is usually an awkward subject, you decided to trust to luck that this little job would offer no such problem, and you could thus avoid mentioning it.

How about Joe, the butcher? He's a repeater of long standing. You've nursed his walk-in box through all the infirmities of old ! age. For most of your service work, Joe has paid



before you had to go to the extent of dropping a bill to him, but lately, Joe has been pushing you off. In fact, there's a little matter of \$10.00 that has been outstanding for over a month. What are you going to

do about him?

A good many service shop owners extend credit on the basis of the volume of business involved. They let a "repeater" ride on the books for a reasonable length of time and operate on a strictly cash basis with a 'one timer.'

Experience dictates that such a policy is sound in a business sense, IF, however, it does not become a hard and fast rule. For here is where the trouble lies. The most successful service shop owners with whom I have come in contact have been willing to "bend" in certain circumstances and have been "polite but firm" in other situations.

In dealing with people, you have no doubt come to the realization that there is always an exception to the rule, that there are times when no rules can apply and when you have to play your hunches and chalk up a case of bad judgment to the break of the game. If you do realize this and do take an occasional chance, you are far wiser than the fellow who doesn't. Tycoons of industry got that way because they weren't afraid to take an occasional risk. You'll find this to be a fact if you examine the biographies of some of our great men.

No Bend-No Pull!

There is a grocery store in my neighborhood. It has been here for twenty years or more, and its ownership has never changed. The owner himself has changedphysically. He has aged far more than his store. He still puts some 60 hours a week into clerking in his own store, and to the best of my knowledge he's not salting away a substantial saving against his old agewhich incidentally, has arrived.

One day I asked this fellow for an esti mate of the percentage of "bad debts" he's sustained in his many years of doing retail business. He did his best to straighten his rounded shoulders and look me "square in the eyes" as he pointed out that, in all of his years in the retail business, he has never carried anyone on the books. He paid cash and he accepted only cash, by gum! Incidentally, his store is badly in need of repair and repainting. This man was born a small business man and will undoubtedly die one. His epitaph could well read-"no hits, no runs, no errors." Let us assume (and hope) that you are more ambitious, more willing to unbend if the occasion appears to warrant it. If, then, you treat individuals on an individual basis, within reason, you may as well expect to find an occasional bad debt. Three or four collection letters in the period

of six weeks to two months will soon enough reveal whether or not you have guessed wrong. And an occasional wrong guess still

won't break you.

All of which brings us logically into a discussion of collection letters—so often a painful and fruitless phase of your business. It is surprising to note that more service shop operators than you may suspect have never used a collection letter. They rely on a "Final Statement" and a prayer—neither of which usually part their account from his money—which is rightfully yours.

Yet, those shop owners who have developed a collection series will tell you that the results are more often good than bad. If you recall, in an earlier discussion in this column, it was suggested that in direct-mail campaigns, a letter and a circular invariably outpull a letter alone or a circular alone. The same may be said of the collection series.

First, of course, should come the bill alone
—not a final statement for this is more
logically a phase of your second collection
effort.

In that second effort you may find, as have others, that a short note on your letterhead along with the final statement will do a much better job of pulling in the delinquent than the final statement alone. The short note should be short, polite, firm! Give the account the better of the doubt: "Perhaps you have overlooked or mislaid the last bill—" Provide him an out, a "face-saver." After all, if you were in a comparable spot, you would welcome such a device.

Effort number three might possibly call for a letter alone—still not a "blisterer!!" Lightness and a shade of humor (whether you think it's funny or not) often bring in

the delinquent.

Or the letter may be strictly serious—
"I am respected by my suppliers because I
pay my bills when they are due or if for
some reason, I cannot, I tell them honestly
and frankly why I can't. I respect you
and I surely want to continue to do so.
Many thanks for your attention to the \$....
owing me." A tack like this, not as brief
as I have made it here for reasons of space,
has paid off for others—try it yourself.

A fourth effort might call into use a telephone call. Diplomacy and tact are again indicated. Why do so many service shop owners avoid this technique? For one thing, it's awkward to confront a man about a debt. It takes courage and it takes self-control, but a telephone call can produce

the kind of result you want. Call a "spade a spade" when you talk to the delinquent—
"I don't like to call you on a matter like this, Mr. Blank, but I can't understand why I haven't received payment. What is the trouble? And so on!

Getting "tough" in your collection effort depends a great deal upon the amount involved, the attitude of the account, the personal, individual factors of which you are aware. Such a



procedure, for obvious reasons, should be a last resort and must be within your legal rights. Don't forget this point! Slander, dunning, and other two-fisted collection techniques can backfire with a whale of a report, and the authorities might hear it! Such methods of collecting are dangerous to you, usually unproductive, and are ac-

tually punishable by law!

Sounds like a great deal of grief and work, this "on-the-cuff" business, doesn't it? And it can be if you don't think it through, don't plan and have ready a satisfactory collection method, don't set up a general policy. Sooner or later in your business relationships, however, the question of extending credit is going to arise. You can't sidestep it, so why not give it a little thought now? Forearm yourself with the experience of others—fellow tradesmen in your community—your suppliers—yes, even this columnist.

Bear in mind, too, that only a very, very small percentage of our citizenry is dishonest, inherently or by design. The rest of us go through life owing a little bit here and there and being owed about the same amount. Most likely, we square our accounts sooner or later, with or without pressure, and with or without pleasure, depending upon how we are dealt with and how

we deal with the other fellow.

And speaking about pleasure, it is a pleasure to remind you—if you need reminding—of the All-Industry Refrigeration and Air-Conditioning Exposition which is being held this month (October 29 through November 1) in Cleveland.

The industry is putting on its bib and tucker for its first postwar appearance before the nation—and the nation rightfully expects a star performance.

(Continued on page 88)

Service Firms Make Early Start Selling Winter Service

By HERBERT HANLEY

THE shortage of new refrigerators in both commercial and domestic distribution has resulted in establishment of "winter service" campaigns by many refrigeration service dealers.

"We formerly believed that there would be fewer service calls with new equipment going in service," Tom Ridenour of General Refrigeration Service & Sales Co. stated, "but with strikes and other delays cutting down on deliveries, we feel that winter of 1946 will offer a bigger service merchandising opportunity than ever. Therefore, above our regular summer service, we're planning plenty of promotion on the idea of fixing up the old refrigerator during the winter months when there is far more time and more men available."

This firm is going after winter service in a simple but effective manner. First, all calls which aren't absolutely essential are "laid back" until the winter months, or at least until fall, by simply talking the customer into it. "We reserve our time for breakdowns, emergency repairs, etc., which are absolute top priority calls, during the summer season," it was pointed out, "and ask everybody who can get by with his current equipment to allow us to make an appointment for winter service, when we can do a far better job at less cost. Despite the fact that many commercial refrigeration owners expect to be able to buy new boxes before that, we don't have much trouble in talking them into waiting for later work, and making a definite appointment." The winter season as Mr. Ridenour sees it is from September 15 to March 30, ordinarily dull months when his firm needs all the business it can get. Already enough business has been written up in future appointments to keep most of the service crew busy.

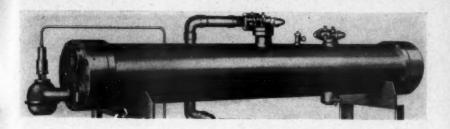
A second idea which helps to build up winter refrigeration service work is offering complete overhauls and rennovation of all types to owners of equipment which is merely "put in operating condition" during the summer. With eight men averaging four to seven jobs per day through sum-

mer, General Refrigeration concentrates on keeping the equipment operating, while asking the customer whether he is willing to let complete overhaul or more technical repairs go until after the hot months are over. "We don't slack on the job" Mr. Ridenour emphasized, "but merely check over each refrigerator thoroughly in addition to repairing whatever caused the service call. We thus find many future jobs which need intensive going over, parts replacement, cleaning, etc., which we mention to the owner as necessary, but not immediately so. Here, too, we attempt to make an appointment for doing the work during the slack winter season, and almost invariably meet with success. The war has taught most businessmen and retailers using refrigeration that money spent keeping it up is very worthwhile expense."

By dint of this "personal contact" promotion of winter service, as well as direct mail, newspaper advertising and follow-ups on last year's customers, General Refrigeration Service & Sales hopes to fill up a work schedule covering at least three months for the winter of 1946—and has gotten an early start on the idea by beginning to look for such "future jobs" during the summer.

Domestics Solicited

In the domestic field, a North Side refrigeration service firm, likewise employing eight full-time service mechanics, has taken a different route to the same goal. Keeping up microscopically accurate records of every home refrigerator repair call made for the past seven years, the firm has set an "average life" period for each of nine popular makes of home refrigerators, and matched this against its own service records. Thus, if a housewife owns an old General Electric refrigerator, which experience shows will usually serve four to five years without attention, the file card made out and put away on the first service call will not appear again for four years-when the refrigeration service firm will take it out, and address a cleverly written direct mail letter to her by name. This begins by pointing out that the firm handled repair work for her at a certain date four years ago. It then offers either an "attention call" or if repairs are in order, points out that the company is anxious to secure winter business, and to do so, features lower rates, more convenient appointments, etc., as an incentive. All of this direct mail, written (Continued on page 88)



Problems in the use of Water-cooled Condensers

By RALPH M. WESTCOTT*

DURING the last seven years my business has been devoted almost solely to problems of water-cooled condensers. We have had a wide variety of experience in cleaning these condensers and in keeping them clean and operating efficiently on a continuing maintenance basis. It is not my intent to appear to be an authority on condenser design, but experience and observation in my field have revealed many self evident conditions which could be improved.

Most of you are familiar with what the condenser does. I like to think of it as the lungs of the refrigeration system-it is the breathing mechanism. All of the heat to be rejected from the refrigerated space and the heat of compression from the compressor must be discharged through the condenser and from there to the atmosphere so that it will not be recirculated and reduce operating efficiency. However, the desired result can be achieved in several ways. It seems to me that there are almost as many designs of condensers as there are designers and manufacturers. On smaller jobs, of course, air-cooled condensers are still to be preferred to water-cooled condensers. cooled condensers will not be discussed since the title of this talk is "Problems in the Use of Water-Cooled Condensers."

Classifying types of condensers is a difficult job, but for the sake of this discussion they will be divided into two general classes:

(1) Those condensers which are non recirculating on waste water, and (2) Those which have recirculating water. In the closed type of condenser, the heat exchange is directly to liquid water, and there is no evaporative effect at the condensing surface; this type includes the double pipe, shell and tube, shell and coil, open vertical shell and tube condensers and a few others. The double pipe may stand in banks so that the flow is parallel or in series. The shell and tube may be vertical or horizontal and multipass or single pass. The shell and coil, which is popular on the smaller jobs, is almost always a single-pass condenser; however, a number of these may be put in parallel on one prime water circuit to and from the tower.

The principal problem of the closed type of condenser is one of insufficient water velocity. Often, this lack of water velocity is not a fault of the fundamental design, but of the installation; for example, the pump capacity may be insufficient to give a large enough volume of water at a high enough velocity to be efficient. This relationship is so important that a basic course in hydraulics should be required of every installation design engineer, and the installing mechanic should have some idea of the principles of hydraulics so that he can catch any defects in the design engineering. Too little attention is given to the pressure drop through condensers, particularly in the shell and helical-coil, single pass type which is commonly used on smaller installations.

* Ralph M. Westcott Co. (chemical engineers), Los Angeles, Calif. Talk presented to Los Angeles Chapter R.S.E.S. These small condensers were designed primarily for waste water and a high temperature rise on the water through them to conserve the quantity of water used. They were designed also to handle initial water pressures generally in excess of those obtainable from recirculating pumps. Water cooling on a recirculating water circuit is dependent on proper size and sufficient quantities of pipes, which have sufficient velocities to do the job for which the condensers were designed.

When these condensers are installed on a recirculating water circuit, they are often installed in parallel. Unless a very careful balance is made between the water flow and heat exchange of the two or more condensers in parallel, the tendency will be for the water to take the course of least resistance. The result will be a lowering of velocity and an increase in the rate of heat exchange on one of them. This increase in heat exchange causes more scale to form and greater restriction, lowers the water velocity and further decreases the flow through the condensers.

If I may judge from my experience, the only closed type of condenser in this general class that is not subject to the problem of water velocity is the open vertical shell and tube condenser. This condenser depends entirely upon proper distribution of the water which is being fed to it; each of the tubes (which are all receiving their water in parallel) must have a nearly equal flow of water. This control can be achieved fairly easily by the use of properly designed distributors at the top of the condenser.

Faulty Application

In fairness to the manufacturers and designers of the shell and tube and shell and coil types, I want to say that much of the trouble in the field is not their fault but the fault of wrong application of equipment. One of the reasons for wrong application is probably that of competitive pricing: sometimes the contractor is forced by the customer to chisel on the condenser. Of the entire refrigeration system, the condenser is probably the most vulnerable part for chiseling; the average customer is unable to calculate just what a condenser contains and what its refrigeration tonnage may actually be, and he is dependent upon the contractor's statement that the equipment is adequate. The second cause of misuse of condensers—a reason of probably equal importance—is a basic ignorance or

indifference on the part of the individual who engineers the installation but does not install a condenser of proper design.

This latter condition is very evident in many of the small installations where condensers designed primarily for the use of "once through" or waste water have been applied to a re-circulating or cooling tower system. When this type is installed on a recirculating water circuit, several difficulties result: pump pressures are lower than city water pressures; less water is available through the condenser; the available water has a lower velocity; temperature differences are higher; and these higher temperature differences increase fouling or the tendency for scale to form from the raw water.

Cause of Scaling

Perhaps I should explain why high heat transfer and low velocity increase the fouling factor or tendency to form scale. There are two constituents, calcium and magnesium salts, which exist in relatively high quantities in the raw water of this area. The unfortunate characteristic of the salts of calcium and magnesium found in raw water (which are largely bicarbonates) is that their solubility decreases with an increase in temperature-contrary to the common impression about the solubility of various chemical salts, such as sodium carbonate (or soda ash) which shows a marked increase in solubility with an increase in temperature. This phenomena of lowered solubility at increased temperature is explained briefly as follows. Calcium and magnesium carbonates are relatively insoluble but as bicarbonates they have a much higher solubility. As the bicarbonates are heated CO2 is driven off leaving the normal carbonates and water.

To overcome this fouling factor we must have higher velocities which will tend to scour away deposits as they start to form; second, we must reduce to an ecomonic minimum the temperature difference on the in and out water from a condenser.

In addition to decreasing the fouling, an increased velocity results in a very definite increase in the rate of heat transfer. An explanation of this fundamental principle of turbulent flow at high velocities as contrasted with viscous or streamline flow at low velocities may clarify this point.

Streamline flow results when the velocity at the center of the pipe is far greater than at the side of the pipe. If the path of any given particle could be mapped, we would find that when the flow is viscous the particle moves in an almost straight line parallel to the flow. Assuming concentric rings radiating from the center, it is easily shown that the particles in each individual ring are moving at the same velocity and that this velocity reduces to practically nil as these rings radiate from the center to the outer pipe surface. When these velocities are plotted on a curve, they take the form of a parabola.

Turbulent flow is one in which all the particles flow in an erratic pattern and in which there is a continuous mixing within the stream itself. A curve representing the velocity at any point across the radius or diameter is much flatter than the curve for viscous flow. The curve for turbulent flow is more nearly a hyperbola. This mixing and erratic flow produces a scouring action at the pipe surface and reduces the film thickness to increase the heat transfer.

Viscous Flow

In the case of viscous flow the heat must be transferred by conduction through these various layers of water, and only a gradual temperature difference exists between the various concentric rings within the stream itself. Water is a poor conductor of heat; therefore, the transfer efficiency in streamline flow is low. The center of the stream is much colder than the portion next to the transfer surface. There will be a much more uniform temperature throughout the cross section of the stream in turbulent flow than in streamlined flow.

Inasmuch as the advantage of turbulent flow is established solely on the basis of increased heat transfer, can we obtain turbulent flow with the equipment available? In some equipment, the fundamental design precludes the possibility of obtaining turbulent flow. This applies particularly to those condensers which were designed primarily for waste water usage: the helical coll and single pass type of condenser.

There are three forms of energy which are inherent in any hydraulic system and which must be overcome by external power sources to keep the fluid in motion. First is the static or pressure head; that is, the net difference in level to which water must be pumped above the normal equilibrium level. For example, the static head against which a pump must operate in a cooling tower application is the height from the water level in the pan of the cooling tower to the discharge at the top of the cooling tower. This

static head is explained by the fact that the downward force to the lowest level from the suction side will exactly balance the upward force of the pan water level on the discharge side. The second form of energy is kinetic or the velocity head which is the energy of motion. The third form of energy is the friction head. This latter form of energy is one that is ignored or overlooked a great deal in the layout of re-circulation water systems. The flow of water through pipes is not a frictionless process as many people seem to think. The very considerable friction involved in this flow depends upon the smoothness of the pipe surface and the pipe diameter; if the pipe is rough, friction is materially increased. Small diameter pipes have a higher friction factor per foot than larger pipes. Friction then acts like a brake on the flow of water, and additional energy is required to overcome the force of friction. In straight pipe, the amount of friction depends on the smoothness of the interior surface and its diameter. All of the various fittings have rather definite friction factors; for example, a 1/3 inch side outlet tee is equivalent to 1% feet of straight 1/2 inch pipe and a globe valve is equivalent to 21/2 feet of straight pipe. Sudden contractions and enlargements in the water circuit set up eddy currents which act as resistances or friction factors which can be likened to those in an electrical circuit; the sudden enlargement and contraction is analogous to the transformer. Transformers generate large quantities of heat regardless of whether they are step-up or step-down transformers.

How to Increase Velocity

On the basis of three illustrations of what has been done with existing systems, I should like to offer a few suggestions for increasing water velocity. The first example involved a closed horizontal shell and tube multi-pass condenser which initially had three tubes to a pass. Head pressures were consistently high and the fouling factor was high; therefore an attempt was made to increase the water velocity by reducing to two, the number of tubes per pass. This change required a redesign of the webs or spider distributors in the head of the condenser. At the same time the condenser was cleaned as it had been in the past. Following this change of design and cleaning, there was a reduction of about twenty-five pounds per square inch gauge in head pressure below what a similarly clean condenser would give before the change. Also it was found that with the

increased velocity the condenser remained cleaner for a longer period. There was no increase in pump size or in motor size; however, I believe there was a slight increase in the actual load on the same motor which, at least theoretically, would have been true from the increased friction of the higher velocity.

Another example was one in which two open vertical shell and tube condensers were set in parallel on a pump circuit, and the water was flooded single pass up through them rather than down from the top in accordance with their original design. The water velocity on this set-up was approximately seventeen feet per minute. Scaling and corrosion were excessive and head pressures ran abnormally high, (approximately 200 psi. to 225 psi). The system was redesigned to permit the passage of the water through these two condensers in series, with each one divided into a two pass condenser. In other words, the water passed through four separate channels in series rather than through two channels in parallel. There was no increase in the amount of water which was forced through this new series circuit. Theoretically, our velocity should have increased about eight times; however, actual tests showed that the velocity was increased about six times. This change immediately effected an average reduction in head pressure of about 50 psi., this reduction in head pressure showed a marked decrease in cost of power per ton of ice, and an increased capacity. Scaling and corrosion were reduced, but the velocity was still far below that of turbulent flow.

Power Reduced 30%

In these two examples, there was no physical change in pumping horse power, the motors were the same, the pumps were the same, and the condensers were the same except for an alteration in their design. The third example is one in which there was no alteration in the condensers, but in which there was a stepped up pump capacity. In fact, a new pump and motor of double the original size were installed. The volume of water was materially increased with this new set-up, and this increased volume of water was passing through the same circuit. Thus the velocity was increased. The power saving in this case was spectacular. The plant operator has kept a very careful cost record of power and product packed out and refrigerated. Even with the increased horse power required for the water pump, there was a reduction in total power cost of about 30%. In addition, the packed out or refrigerated load was doubled with a consequent reduction of approximately one third in cost of refrigeration per unit of refrigerated product.

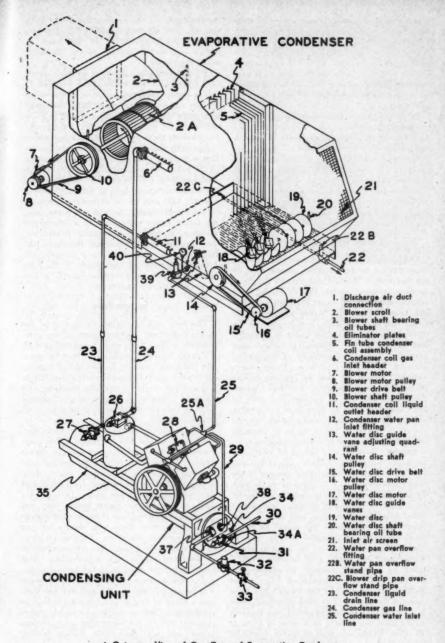
These cases are by no means exceptions. There are many systems which could be similarly improved. There is a mistaken impression that water pumping costs will be too high if proper volumes at adequate velocities are pumped. Water pumping horse power will average only about \(\frac{1}{10} \) the f the rating of the compressor motor. Therefore, a reduction of 10% in head pressure, by increasing pumping horse power 10% will show a net gaint in power saving of about 9%. An increase in condensing temperature of 10° F. will cause an increase in power consumption of about 15% regardless of the refrigerant used.

Another common practice is to place a number of shell and tube or shell and coil condensers in parallel on the same pumping circuit. Condensers of the shell and coil type particularly have a large pressure drop through them, and they must be properly balanced to obtain uniform efficiency from each one.

Evaporative Condensers

So far I have talked primarily about shell and tube condensers. A newer type—one which is becoming increasingly popular—is the evaporative condenser. For those of you who may not be familiar with this newer type, it has been desreibed as a factory-made assembly of elements including the refrigerant condensing coil, a fan for forced air circulation, and a water spray system over the condenser coil. This method, in effect, combines in one unit, the condenser, the cooling tower, and the water distribution or pumping system.

Evaporative condensers use two types of water circulation: (1) waste water, and (2) pump recirculated water. In the waste water evaporative condenser, sometimes called an economizer, the theoretical objective is to evaporate all of the water sprayed on the refrigerant coil and to have this total evaporation complete when the last drop of water has reached the bottom tube of the condenser. Thus, the entire latent heat effect of all of the water used would be available. In this area, however, the dissolved solids have a fouling effect when the water is evaporated completely. To reduce fouling in this type condenser, there must



A Cut-away View of One Type of Evaporative Condenser.

be an excess of water flowing over the condenser coils and going to waste to provide a washing action and also to reduce the concentration of any particle of water. The amount of water thus used will be far less than is required for a waste water shell and tube condenser because the latent heat effect of a considerable portion of the water is still used.

In the course of the development of the evaporative condenser, many theories of design have been tried: experiments have been conducted with various types of water distribution, air distribution, fin surface, prime surface, and location of the coils. Evaporative condensers of these various designs which we will consider now are those of the recirculating water type. Perhaps I should discuss some of the problems which have been encountered in design.

Faults in Condensers

First, if the coils are finned too closely, there cannot be an adequate counter flow of air and water. In fact, the finning has been so close on some models that in attempts to counter-flow air and water the condenser coil has been loaded with water so that water could not fall through, nor could air be drawn through; thus the water is virtually left to boil at the condensing surface and further increase the problem of depositing scale on the transfer surface. From observation, I would say that fin spacing should be equal to the fin heights. Further I would discourage the use of parallel fins such as are commonly used on blower or evaporator coils. Very serious consideration should always be given to the problem of cleaning when designing an evaporative condenser.

Second, there is a problem of obtaining adequate water distribution even if the coil is open enough to permit free passage of the water downward as it is sprayed on the coil. If these condensers are to operate efficiently, they must be flooded at all times with water over their entire surface, and only a relatively small amount of the water so circulated should be evaporated in any unit of time. Those of you who are anxious about water pumping costs may wonder what I mean by a "small amount" of evaporation of water. If the recirculation rate is two gallons per minute per ton (which has been more or less accepted as good practice) there is an evaporation loss of about one fortieth of a gallon per minute or a ratio of 80 to 1. In other words, one unit of water would be evaporated for each eighty units of water recirculated. If the ratio is much less than this, the fouling factor materially increases because the temperature of the water is higher and the deposition of the dissolved solids is greater.

A third problem is that of placing super heat coils above the water spray headers. If this is done, entrained moisture is drawn up by the fans to these super heat coils and waterever solids are in that water will be deposited on the coils with no opportunity for washing them by the recirculating water.

A fourth practice to which we take exception is that of placing receivers in the pans of the evaporative condenser. Whatever sub cooling effect this might give is off-set by the disadvantage of having valves always in a water bath and by the attendant corrosion on the receiver tank. Actually, in many jobs, the liquid is not sub-cooled in a submerged receiver; instead, it is actually heated up, for through evaporation on the coils, the liquid can be condensed to a temperature lower than that of the water in the pan and ambient air temperatures may be as low or lower than the pan water.

Suggestions

The last, and of course, to us one of the most important things about these condensers, is that they must be installed with adequate drainage facilities so that the pans and condensers can be flushed out at regular intervals to keep them efficiently clean. There is a similar need for periodic checking and cleaning. Moreover, the entire unit should be in a location which can be reached with reasonable ease.

As a result of our experience on these condensers, I should like to make a few suggestions to you and the customer to obtain improved operation from evaporative condensers: Place the condensers where there is plenty of clean air because food odors and dust will cause slime and scale. Do not leave them in hot engine rooms unless they are supplied with fresh air through ducts; even then, don't cover them with ducts, for you still have to get into them. Establish a bleed or blowdown to reduce the reconcentration of dissolved solids from evaporation. This bleed should be equal to 1/2 the normal makeup, i.e. the average evaporation loss of water will be approximately 11/2 gph per ton hour and a bleed of % gph per ton hour should be established. This principle of a bleed applies equally well to the operation of a cooling tower and will materially reduce scaling problems.

Measuring The Output of An Air Conditioner

That very important air conditioning customer will be yours if you can show him just what his equipment is doing.

By EDWARD DOWIS

WHEN a summer air conditioning system fails to maintain required conditions, it may be due either to mechanical conditions or a futile attempt to carry a cooling load in excess of its capacity. Overloading a conditioner may produce symptoms similar to mechanical failure and many times it will be necessary to actually measure the total cooling and dehumidifying effect. Once the load is adjusted to the capacity of the equipment no additional servicing may be necessary. If it is, the job of trouble shooting is greatly simplified. The customer will correct conditions in his building or purchase equipment adequate for his needs when he is convinced his present equipment is giving good account of itself, and everybody will be happy.

Measuring the output of an air conditioner consists in determining the quality of air passing through it, in pounds or cubic feet per hour and the reduction in heat and moisture content of the air as it passes through. The total cooling effect per hour will be the total weight of air per hour times the heat reduction per pound. It should be remembered that total heat means heat due to temperature which we call sensible heat and heat which must be extracted to condense water vapor, or latent heat. A summer conditioner is, normally, removing both sensible and latent heat because the cooling coil is cold enough to cause water to condense on its surface. In condensing, this water gives off heat, just as does refrigerant in a condenser. At air conditioning temperatures, the latent heat of water vapor is 1050 Btu. per pound,



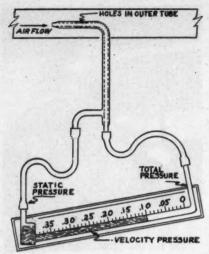
Measuring the air output of a grill with the aid of a velometer.

which means that for every pound of water condensing on the coil, 1050 Btu. are absorbed by the refrigeration equipment, in addition to that absorbed in cooling the air. The latent cooling can be determined by weighing the water condensed in one hourand multiplying by 1050.

The volume of air, in cubic feet per minute (cfm) is the product of the velocity of air flow in feet per minute. (fpm) times the area of the outlet or inlet or duct where it is measured. Thus, a conditioner delivering air at an average velocity of 1200 fpm, through a duct with an area of 2 sq. ft., will deliver 1200x2 or 2400 cfm.

The velocity of an air stream may be measured with either of several instruments, similar to the two herein described. One of these is the anemometer, which consists of a vaned wheel or a pivoted vane in a case which can be held in an air stream, and connected to a suitable dial. The revolving wheel type measures the linear feet of air passing in a given time and the deflecting vane type indicates instantaneous velocities due to the pressure exerted on the vane by the passing air. Strictly speaking, any instrument used for measuring the velocity of fluid flow may be called an anemometer.

For measuring air velocity in a duct or confined space, a Petot tube connected to a manometer or draft gauge will indicate the pressure due to air movement. This instru-



Petot tube and manometer measuring velocity pressure.

ment is also of use in determining the static pressure in any part of a system. These pressures are expressed in terms of inches of water, meaning the height which the pressure will lift a column of water. Inclined manometers will measure this pressure accurately to hundredths of an inch. Dial gauges connected to similar tubes may be calibrated to read pressures in inches of water or air velocity direct.

A few precautions must be observed in order to get accurate velocity measurements. In determining air quantity, average velocities must be used. The velocity will rarely be uniform at all points in a duct or at a supply outlet, so it is necessary to divide the area into sections and take a reading at each section, and take the average of these veloci-



Taylor Biram's type anemometer.

ties. The instrument must be held in the direction of the air stream and, if used at a supply grille deflecting the air at an angle to the wall opening, the instrument should be held in the direction of air flow. Smoke is useful in indicating the direction of air flow and distribution.

Anemometers are not accurate over their entire scale and a correction chart is furnished, showing what should be added or deducted from each velocity reading, in order to get a true reading. It will usually be necessary to add to readings taken at low velocity and subtract from readings at high velocity. There will be a limited range where no correction is necessary. It is important to have this chart for the particular instrument used.

Inclined Tube

In the absence of a factory calibrated instrument, the writer has used a piece of ½" copper tubing as a jet, with the openings carefully reamed to remove burrs and connected by rubber tubing to a U, or preferably an inclined tube manometer. This can only be used at supply openings and is not as accurate as a tube especially designed for this work and should be checked with an accurate instrument if possible. It will, however, give satisfactory results if no other instrument is available. The most simple arrangement of this kind is illustrated with a U manometer, but for low velocities, an inclined tube will be necessary for accuracy.

The Petot tube is probably the most accurate instrument readily available except the factory calibrated velocity instruments, and can be used at supply openings and inside ducts. As illustrated, it consists of an inner tube within a larger one, the inner tube being connected to the end opening and is pointed into the air stream. In a duct, it registers the velocity pressure plus the static pressure. The outer tube is closed on the end, but has a number of very small holes drilled in it's side and, when the tube is pointed in the proper direction, registers only the static pressure within the duct. When the inner tube, registering total pressure, is connected to one end of a manometer, and the outer tube, registering static pressure, connected to the other, the difference, or velocity pressure will be indicated by the manometer. The velocity can be found by the formula

Velocity = 1096 X $\sqrt{\frac{\text{Velocity pressure}}{\text{air density}}}$

For standard air containing 13.33 cu. ft. per pound, this can be reduced to Velocity =

4005 X the square root of the velocity pressure. Tables are available, showing the velocity of standard air corresponding to different velocity pressures, without using a formula.

Summarizing, the quantity of air passing through a conditioner is found by taking the average of a large number of velocities at the supply grille or in the main duct and multiplying by the area in square feet. Practice in checking instrument readings with known quantities of air will be of assistance in learning how to get accurate readings. It is very necessary to use an instrument suitable for the velocity to be measured.

Because conditioners are rated in Btu. per hour, it is convenient to reduce our air quantity to pounds per hour. For standard air, which weighs .075 lb. per cu. ft., the cfm. X 60 X .075 or, more simply, cfm. X 4.5 will give the pounds of air per hour.

Cooling Effect per Pound of Air

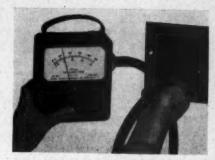
Having determined the quantity of air circulated through the conditioner, it is necessary to find the heat removed from each pound of air. The only instruments required for this are a dry bulb and wet bulb thermometer. It is best if the thermometers are identical except that one should have the bulb covered with a moist cloth or wick, thick enough only to keep the bulb moist but not restrict heat flow.

Sensible Heat Measured by Dry Bulb

Air, at usual temperatures, has a specific heat of .241, meaning that it requires .241 Btu. to raise the temperature of one pound of air one degree Fahrenheit. Therefore the total sensible cooling done by a conditioner, per hour, is: Pounds per hour X temperature difference X .241. So, in order to determine the sensible cooling it is only necessary to measure the dry bulb temperature of the air entering the conditioner, and that leaving: The difference X the pounds of air per hour X .241 will give the sensible cooling in Btu. per hr. for standard air. For especially high altitudes, allowance should be made in calculating poundage of air, for the difference in weight per cubic foot.

Measuring Latent and Total Heat

In addition to the sensible cooling, the conditioner is usually removing moisture also. Summer air often contains considerable water vapor and each active person in the conditioned space may give off almost ½ pound of water vapor per hour plus certain



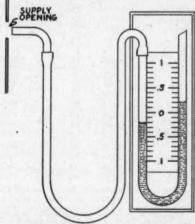
Velometer made by Illinois testing laboratories.

Tests velocity in feet per minute.

appliances such as steam tables, coffee urns, etc., which give off mosture. One method of estimating the latent cooling is to weigh the water condensed per hour and multiply by the latent heat of water vapor; (1050 for normal conditions). This figure, added to the sensible cooling will give the total heat removal, per hour. To reduce this to tons we divide by 12,000.

Wet Bulb Temperature

An easier and more accurate method of calculating the latent and total heat is to take wet bulb temperature readings in addition to dry bulb. A wet bulb thermometer will always read a lower temperature than a dry bulb, except when the air is saturated with moisture. This is because part of the water on the bulb exaporates into the air,



U Tube Manometer and single jet.

and the rate of evaporation for any given temperature depends upon how much vapor is already in the air. In absolutely dry air, the rate of evaporation is greatest, diminishing until, in saturated air, no evaporation takes place at all, and the wet and dry bulb temperatures are the same. In less than saturated air, some evaporation takes place from the water on the bulb, and in so doing, takes up heat from the bulb, reducing it's temperature below a dry bulb reading.

The Psychrometric Chart

Psychrometric charts and tables have been prepared which will tell a great many things about the air, from the wet and dry bulb temperatures. Sufficient for our purpose is this:

 The dry bulb thermometer indicates sensible heat but is not an indicator of latent heat.

2. The wet bulb temperature is affected both by sensible heat change and moisture, consequently a table can be prepared which will indicate total heat indicated by any wet bulb temperature, with accuracy sufficient for practical calculations.

TABLE I

W.B.	Вту.	W.B.	Bru
TEMP.	Ln.	Темр.	La.
40	15.21	66	80.39
41	15.67	67	31.15
42	16.14	68	31.92
43	16.62	69	32.71
44	17.10	70	83.51
45	17.59	71	34.33
46	18.09	72	35.17
47	18.60	73	36.08
48	19.12	74	36.91
49	19.65	75	37.81
50	20.19	76	38.78
51	20.74		39.67
52	21.80	78	40.64
53	21.87		41.68
54	22.45	80	42.64
55	23.04	81	43.67
56	23.64	82	44.75
57	24.25	83	45.80
58	24.88	84	46.91
59	25.52	85	48.04
60	26.18	86	49.20
61	26.84	87	50.89
62	27.52	88	51.61
63	28.22	89	52.86
64	28.93	90	54.18
65	29.65		

Reprinted by permission from Properties of Steam and Ammonia by G. A. Goodenough, published by John Wiley & Sons, Inc.

One of the most practical tables of the properties of mixtures of air and saturated water vapor is that by G. A. Goodenough in his "Properties of Steam and Ammonia," published by John Wiley and Sons, Inc. It is from this table that the values in Table I were taken.

With this table, it is only necessary to take the difference between the heat content of the air at the entering and discharge wet bulb temperatures, and multiply by the pounds of air per hour, in order to get the cooling effect in Btu, per hour.

An Example

One practical example should illustrate how the output of any conditioner may be measured. Suppose it is desired to measure the output of a self contained conditioner, with a grille 33" x 8" through which the air is discharged into the room. The conditioner receives air at 75° dry bulb and 65° wet bulb, and delivers air at 63° dry bulb and 56° wet bulb. We find the average air velocity at the grille to be 800 fpm.

The air quantity will be: 33"x8"

= 1.83 sq. ft. x 800 fpm or 1464 cfm.

Multiplying this by the factor 4.5 as explained in a preceding paragraph we get 6588 pounds of air per hour.

Referring to our heat chart, the total heat per pound for entering air at 65° W. B. is 29.65 and leaving at 56° W. B. 23.64, a difference of 6.01 Btu. per pound, multiplied by 6588 pounds per hour, gives 39,594 Btu. per hour, and dividing by 12,000, we have 3.3 tons.

Amount of Sensible Heat

If we wish to find how much of this is sensible we take the dry bulb temperature difference (75-63) 12x6588x.241 as explained previously and get 19,052 Btu. per hour sensible. The latent heat is the difference between total and sensible: 39,594 — 19,052 = 20.542.

There it is, and it will work on the smallest to the largest of them. Just be careful to get the most accurate instruments you can and be careful of your velocity measurcments and take average velocities at grilles or in ducts.

This air conditioning can be as interesting as it is profitable.

Next month we will discuss adapting the air conditioner to winter service.



Equipment-Send Your Problems to the Question Box.

CORRECTION

IN THE August issue Question 759 is What Is a Reciprocal. You are right in the answer to that, but you say that I divided by 2 equals .05. Is this right? When I figure this the result is 0.5. I believe the person asking this question can understand your answer better if you write it as follows: In mathematical terms resistance is the Reciprocal of Conductivity, or 1.0 divided by the conductivity equals the resistance. Conversely, 1.0 divided by the resistance equals the conductivity. Thus-1/R equals k .-J. K. Boyd.

You are right in your correction in that the result should be 0.5 instead of .05. This was a typographical error in the locating of the decimal point.-Editor.

x x x

BANANA RIPENING

OUESTION 763: I have been working with a produce company for some time operating a banana ripening room. They wish to build a new building for this business. I would like to have information as to how much heat bananas produce per pound in Btu. during the ripening process. If you have any bulletins on banana ripening and storage I would appreciate receiving a copy.

Answer: There is very little information at our command on banana ripening. However, here are the important points to remember when designing ripening rooms:

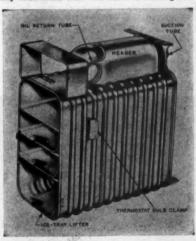
The lowest temperature at which green bananas can be stored without damage is 56°. Below this temperature the fruit will be injured by discoloration spots and will not properly ripen when placed in the ripening room. Ripening rooms are held at 68° and after the fruit is ripe the temperature can again be reduced to 56° for storage. A week to ten days storage is about the maximum.

The approximate rate of evolution of heat for bananas at 68° is as follows. The figures shown are Btu. per ton per 24 hours. Green Turning-9240 Btu,; Ripe -8360 Btu.; 8360 Btu. The specific heat of bananas is

about 0.80 for the fruit in all stages of ripening.

GRUNOW EVAPORATOR

OUESTION 766: I would like to know if a Grunow 37 W evaporator could be used with an expansion valve, for a methyl chloride or 'Freon' unit. In other words, does it contain any aluminum that will react to these gases?



Answer: The Grunow evaporator does not contain aluminum so that it is safe to use methyl chloride or "Freon" in this unit. However, these evaporators are of the flooded type and an expansion valve will not work satisfactorily with a flooded type evaporator. They will operate but with the probability of a good deal of trouble. Therefore, in preference to an expansion valve I would suggest you use a high-side float or capillary tube as a metering device.

FRIGIDAIRE STICKS UP

OUESTION 767: I have a Frigidaire domestic using a high-side float. The compressor struck up four times. What could be the trouble? This job has cost me \$300.00 in actual money. Would you leave xylene in the machine or warrenoll? Would you add a drier on suction line?

It worked perfect until the customer wanted the highside float changed because it

sweated the liquid line.

Answer: From the description of your trouble on the Frigidaire refrigerator it would seem that there must be a leak somewhere in the low side which is drawing in moisture with the air. However, it could be that the moisture has been in the system for some time and is circulating back to the compressor causing your present trouble.

Of course there is nothing like having a system thoroughly cleaned, containing nothing but clean oil and refrigerant, but I would think in this case you could be excused for using one of the solvents such as xylene or warrenoll. Xylene, as you know, is a solvent which tends to loosen carbon sludge formation, permitting it to circulate with the refrigerant and oil through the system. For this reason it would be very necessary to install a filter in the liquid line to catch the carbon circulating with the refrigerant.

A drier would probably be a good idea, particularly if there is any suspicion of a leak in the low side. I would not recommend changing to any other refrigerant because it would not overcome your moisture troubles. It would merely transfer the trouble from the compressor to some other part of the unit.

FLORIST BOX

QUESTION 768: What will be the total heat load per hour of a florist's cooler 5' wide by 9' long and by 8' high under the following conditions: Walls—3'/2" thick regranulated cork insulation; floor and ceiling—3" thick corkboard insulation. Temperature of the air inside the cooler is 38° F., while the temperature outside averages 78° F. Forced air circulation is used and the required running time of the unit has been estimated at about 14 hours per day.

Answer: My calculations show that the ceiling and floor of the florist cooler which is insulated with 3" of cork will represent a heat leakage of 11,700 Btu. per 24 hours, and the walls with 3\(\frac{1}{2}\)" of cork 28,100 Btu. per 24 hours. The total leakage, then, is 39,800

Btu. for the 24 hour period.

Since you desire that the machine operate 14 hours per day, we would have to divide this figure by 14 which gives us a Btu. rating per hour for the machine of 2,130.



E. J. Steinman, owner of the electrical appliance business pictured above, opened business in December, 1945. He combines sales and service on refrigerators, radios, lighting fixtures, small appliances and oil burners with electrical contracting and has found plenty of work to do.

appliances and oil burners with electrical contracting and has found plenty of work to do.

The work shop is in the basement of the above building and the display room on the first floor.

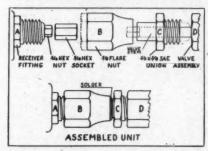
The second floor is divided into two apartments occupied by Mr. Steinman in one and his son in the other.



HOSTESS ADAPTER

A N ADDITION to the hermetic charging valve kit is this adapter for hostess unit. I have found this assembly very satisfactory to purge and charge hostess units.

To make up this connector I use one long %" flare nut. I cut off two threads so as there would be sufficient space for an open end wrench to fit nut between receiver and flare nut. Next, one end of a %"x%" S.A.E. union is cut down to diameter and length on lathe so as to fit snugly on the inside back



The drawings will give an idea of how it is assembled.—Submitted by Louis Degilio, Timmins, Ontario.

S S S

\$125.00 MOUSE TRAP

I RECEIVED a service call on a Frigidaire Model 6-36. The user complained of excessive noise and was disgusted with it. Upon arriving at the user's home, her observation went like this—"Isn't that racket terrible? We have looked it over and cannot find anything that is causing the noise. We called a refrigeration serviceman in Detroit, capable of handling any job. His analysis, after quite some time, was that the unit was in very bad condition and to be sure of a good job he would have to take the refrigerator to the shop and overhaul it for a charge of \$125.000." The user said before they would pay that much they would use ice—in it until the new refrigerators were available and then trade it in.

The second call was made to another refrigeration serviceman. His analysis was quite the same as the first, except that he did not want to tackle it because it was a sealed unit. He suggested they call the Frigidaire people as the unit had gone so far that it would require an overhaul job. By that time you can see why the user was thoroughly disgusted with the whole thing. The user decided to call just one more serviceman and here is where yours truly was called.

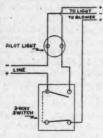
My first thought was a broken hanger hook or spring. No good. My second thought—tubing binding, vibrating against part of condenser or cabinet. Slight hand pressure on tubing at bottom of condenser eased noise some. Close examination with more pressure against tubing revealed a glimpse of a piece of wood flush with the condenser surface and capillary inlet. A little more pressure with the use of a flashlight revealed, or unveiled, a 10c mouse trap. The mouse trap was covered with lint and dirt, therefore by looking down the chute it was impossible to locate it.

The user was never so surprised before. "Just to think my husband and I had given it up as worn out" were her exact words. Well I was surprised, too. I have found mice, rats, mice nests, rat nests, and the trap at last.—Submitted by O. J. Paul, Hazel Park, Mich.

LIGHT AND FAN SWITCH

HERE is a method of turning off the blower fan in a walk-in cooler when one desires to enter the box or work therein. It is found to be desirable and necessary to stop the fan when entering or working in the box in order to avoid exposure, especially if one is sweating or very warm upon entering.

Most all of the walk-in coolers which I have seen have a separate switch for the light and a separate switch for the blower coil fan motor. With this type of hookup it happens very frequently that the fan is left turned off which results in no refrigera-



tion. This condition can be entirely remedied simply by using a 3-way switch to control the fan and light and pilot light. When this switch is in one position the fan will be on and the light will be off. In the opposite position, the light inside the box and the pilot light outside the box will be on and the fan will be off. Thus upon leaving the box, when the light is turned off the fan will turn on; the opposite is true upon entering, for now when the light is turned on the fan will stop. The external pilot light serves as a reminder to snap switch upon leaving the box.

Here is a simple wiring diagram.—Submitted by Walter F. Garing, Honesdale, Pa.

* * * *

REPAIRING SUPERFEX

I HAD a complaint on a Superfex oil burning refrigerator that the cabinet would not freeze. I hauled it into the shop and purged out the hydrogen gas which accumulates in the condenser on ammonia jobs, and filled up water tank with about 30 gallons of water. Do this first or there might be an explosion. Purge valve is on the left rear of cabinet on top. You add the lead pipe on the purge valve and run into water. When the bubbles cease you have all the hydrogen gas out. Next install three new oil wicks. You can get them in any good hardware store.

When these machines are working right there will be a bubbling noise in the coils. It will not freeze up as fast as the electric boxes, but it will be cold enough when it does freeze. We lit the burners, using one quart of kerosene and left the job at 5 P. M. The next morning the box was down to a low temperature. You must have flames high enough to work properly.

There are several machines in this area giving good service. Very seldom do you have to send the freezing unit to the factory for repairs. The factory will ship you the ammonia equipment to recharge them.—Submitted by Julian M. Gantt, Montgomery, Ala.

8 8 S

DRILLING GLASS

OCCASIONALLY the serviceman has need to drill holes through glass, particularly in those installations where glass partitions or shelves may be used, and it becomes necessary to drill openings through which tubing, electrical wiring or drains may be passed.

Where possible it is usually advisably to take the glass to an experienced cutter and have the hole cut. However, where it is necessary to do the work on the job the following suggestions may be helpful.

For cutting holes for tubing and electric wiring, a piece of brass or copper tubing having an outside diameter equal to the



size of hole required will do the job. Revolve the tube at a peripheral speed of about 100 feet per minute and use carborundum 80 to 100 grit and light machine oil between the end of the tube and the glass. The abrasive can be inserted with a thin piece of wood each time the drill is lifted, or the tube may be used as a reservoir to hold it. While drilling, the glass should be supported by a felt or rubber cushion slightly larger than the hole to be drilled. Where possible, drill half way through, then turn the glass over and drill to meet the hole.



For drilling small holes through which wire hangers may be passed, an old three-cornered file ground to a long tapering point can be used. Grip the file in a drill chuck and rotate rapidly. Use a mixture of turpentine and camphor as a lubricant.—Anonymous.





CONVENTION
HEADQUARTERS
HOTEL HOLLENDEN

Within two blocks of the Cleveland Public Auditorium.

On To Cleveland Says R. S. E. S.

R EADY for its first postwar convention, the Refrigeration Service Engineers Society anticipates its most important annual convention in Cleveland October 26 through October 29 at the Hollenden Hotel. This will be the ninth annual meeting of the organization, the first since May, 1942. Annual meetings were postponed in compliance with government requests to conserve rail and hotel facilities while the nation was at war.

The convention immediately precedes the All-Industry Refrigeration and Air Conditioning Exhibit which will be held in the Cleveland Public Auditorium two blocks from the Hollendon Hotel, official head-quarters of the Society. This arrangement permits the members of the R. S. E. S. full freedom for attendance at the All-Industry Exhibit.

The R. S. E. S. convention will be formally called to order on Saturday afternoon, October 26th, to dispose of the usual business and to permit a full three-day educational program on the following Sunday, Monday and Tuesday.

Schedule of Meetings

Saturday, October 26—2:00 to 5:00 p. m., Business Session. 8:30 p. m., Get Acquainted Party.

Sunday, October 27—9:30 a. m. to 12:30 p. m., Educational Session. 12:30 p. m. to 1:50 p. m., Luncheon. 2:00 p. m., to 4:30 p. m., Educational Session.

Monday, October 28—9:30 a. m. to 12:00 noon, Educational Session. 1:30 to 5:00 p. m., Visits to Plants. 8:30 p.m., Banquet.

Tuesday, October 29—9:30 a. m. to 3:00 p. m., Educational Session.



C. BUSCHKOPF Beaver Dam, Wis. Acting President



S. B. GARLAND
N. Attleboro, Mass.
2nd Vice-President



C. J. DOYLE, Omaha Treasurer

The educational program has been carefully planned to provide subjects of vital interest in the future planning of the refrigeration service field. Speakers will represent outstanding authorities in their particular fields and they will bring factual information to keep the service engineer abreast of the developments that are being planned by the manufacturers of equipment for the application of refrigeration in the future. The All Industry Exhibition provides the opportunity of seeing the actual equipment.



REFRIGERATION SERVICE ENGINEERS SOCIETY HOTEL HOLLENDEN · OCT. 25,27,28,29

Hotel Reservations

Advance reservations indicate that Cleveland will play host to thousands of visitors during the latter part of October. The majority of hotels are already reserved but late reservations are being forwarded to the Housing Committee of the Cleveland Convention and Tourist Bureau, who, because of their experience in handling large conventions, are acting as a clearing house for placing late registrants in hotels and private homes convenient to the Cleveland Public Auditorium.

The Educational Program

The three-day educational conference of the Society provides an intensive refrigeration education for all interested in the service industry. The titles of the talks indicate the importance of the subjects to be discussed, and the speakers assigned to the respective subjects are prominent authorities in their fields.

Under the capable supervision of A. M. Fenwick of Cleveland, Chairman of the International Educational Committee, and Paul Reed, Milwaukee, Wisconsin, who served as Chairman of the Wartime Educational Committee, the program has been prepared, and as at this time of going to press will include the following:

Speakers

"The Refrigeration Service Engineer's Place in the Industry"—H. F. Hildreth, Mgr., Refrigeration Spec. Department,



H. T. McDERMOTT Chicago Secretary



WM. J. MARSHALL Leaside, Ontario, Canada Sergeant-at-Arms



J. L. DRISKELL, Burley, Idaho Member, Board of Directors

Westinghouse Electric Corp., Springfield,

"Things We Need to Know About Foods"

-Dr. Donald K. Tressler, Food Technologist, Westport, Conn.

"Modernization and Replacement of Obsolete Equipment"—E. A. Siebert, Director of Service, Kelvinator Division, Detroit.

"The R. S. E. S. Looks Ahead"—Paul B. Reed, Perfex Corp., Milwaukee, Wis.

"The Two Temperature Refrigerator"—R. W. Ayres, Chief Engineer, The Coolerator Co., Duluth, Minn.

"The Modern Repair Service Shop"-V. R. Kruse, Woodstock, Ill. "Development in Shaft Sealing"—Willis Stafford, Engineer, Chicago Seal Co., Chicago, Ill.

"Recent Developments in Thermal Expansion Valves"—(Speaker to be announced).

"Hermetic Units and the Service Engineer"—L. W. Larsen, Asst. Sales Manager, Refrigeration Div., Tecumseh Products Co., Tecumseh, Mich.

"Preventive Maintenance of Air Conditioning Equipment"—M. Goddard, Carrier Corp., Syracuse, N. Y.

"Financing Your Business"-W. C. Irving, Santa Monica, Cal.



E. A. SUMMER Raymond, Miss. Member, Board of Directors



A. D. McGILL, Peoria, III. Member, Board of Directors



W. W. ALLISON, Los Angeles Member, Board of Directors



W. W. FARR, Cleveland Member, Board of Directors



JOHN K. BUSH, Lockport, N.Y. Member, Board of Directors



A. M. PALEN, Minneapolis Member, Board of Directors

"Responsibilities of Servicing Equipment in the Low Temperature Field"—E. T. Benson, Engineer, Frigidaire Corp., Dayton, Ohio.

"Servicing Ammonia Compressors"—Wm. G. MacBride, York Corp., York, Pa.



A. M. FENWICK, Cleveland Chairman, International Educational Committee

Entertainment

The lighter side of convention life has not been neglected, and the Cleveland convention committee together with all Ohio chapters cooperating, have arranged a program of events that will make your visit to Cleveland a pleasant memory for years to come.

Buffet Supper

On Saturday evening, October 26, at 8:30, arrangements have been made for a "Buffet Supper Get-Acquainted Party" in the Grand Ballroom at the Hollenden Hotel, which

will provide a fitting start for the events to follow.

Congresswoman Frances P. Bolton To Address Luncheon

On Sunday, October 27, at one p. m. members, guests and their ladies are invited to luncheon to be held in the Hollenden Hotel at which the principal speaker will be Congresswoman Frances P. Bolton o. Ohio. The Congresswoman is a member of the important House Foreign Affairs Committee and her address will provide an inspirational note on current-day problems.

Annual Banquet

Monday evening, October 28, the annual dinner-dance of the Society will be held in the Grand Ballroom at the Hotel Hollenden at 8:30. All entertainment features provide an unexcelled opportunity to renew acquaintances with old friends and make new ones among service men attending from all points in the United States and Canada.

Plant Visits

Monday afternoon has been set aside on the convention program to provide interesting conducted tours to outstanding refrigeration installations and manufacturing plants. Members will have the opportunity of seeing one of the largest industrial refrigeration installations in the country when they visit the laboratory of the National Advisory Committee for Aeronautics, the world's largest engine research laboratory,



H. F. HILDRETH



E. A. SIEBERT



PAUL B. REED Speakers at the 9th Annual RSES Convention



R. W. AYRES

and which in 1946 began construction of the first supersonic tunnel capable of conducting propulsion tests up to one thousand miles per hour.

Another visit will include a tour to the General Electric Nela Park Lighting Laboratories, and for those members who desire to see a refrigeration manufacturer of valves and fittings, a visit to the Weatherhead Co. will be an interesting one.

Under the guidance of Cleveland Chapter, all R. S. E. S. chapters located in Ohio, consisting of Akron, Canton, Cleveland, Columbus, Dayton, Lima, Medina, Southern Ohio Chapter at Portsmouth, Toledo and Youngstown, are acting as hosts to the visiting delegates. Paul Spring, president of Cleveland Chapter is general convention chairman, with George Schuld of Cleveland as general coordinating chairman.

YOUR RSES REGISTRATION BADGE IS YOUR ADMISSION TO THE ALL INDUSTRY REFRIGERATION AND AIR CONDITIONING EXHIBIT

5TH ANNUAL MEETING OF RSES AUXILIARY

VHE International Auxiliary of the R. S. E. S. will meet during the convention of the R. S. E. S. and meetings and



MRS. G. W. DRESBACK, National Chairman social affairs have been planned for the various ladies' functions. Mrs. Warren W.



They will present interesting papers at 9th Annual RSES Convention



W. C. IRVING



E. T. BENSON



M. GODDARD

ORKING CHISTER

are dependable in any position or any temperature & location



October, 1946

56

THE REFRIGERATION

ly position and location of an A-P Thermostatic Expansion

the body in any position, or in any temperature demanded by the body in any position, or in any temperature demanded by the limitations of your application. Further — the valve body in be placed either higher or lower than the thermostatic bulb fout affecting the valve operation in any way.

Egerative simplifies installation — a fact that thousands of geration service engineers are proving every day to their profit. And it is because of the A-P type of construction of the liquid cross-charged power element and loading spring the which combine to maintain the large sensitive diagon in constant equilibrium for accurate refrigerant control is all conditions.

Fis only one of many features that help you to faster, easier illation of A-P Thermostatic Expansion Valves and assure accurate, DEPENDABLE refrigerant control on any system, of small ... for your greater profit in refrigeration service.

BMATIC PRODUCTS COMPANY

P. 12 E. 489M ST., o MEW YORK 14, N. Y.

REFRIGERANT VA

ALCOMMENDED AND INSTALLED BY LEADING REFELCEDATION STRVICE ENGINEERS

ION



MRS. A. W. OVERMAN, National Secretary

Farr, Cleveland, is the local chairlady of the

ladies committee. The International officers of the Ladies' Auxiliary are:

President: Mrs. Doris Dresback, 818 E. Chestnut St., Bloomington, Ill.

First Vice President: Mrs. R. C. Mc-Carthy, 528 S. First St., Rockford, Ill.

Second Vice President: Mrs. A. W. Gruber, 1029 N. 5th St., Ironton, Ohio.

Secretary: Mrs. A. W. Overman, 421 Forest Ave., Rockford, Ill.

Treasurer: Mrs. Weldon Andrews, R. D. 3, Syracuse, N. Y.

Sergeant at Arms: Mrs. John K. Bush, 555 High St., Lockport, N. Y.

Directors: Mrs. V. R. Kruse, Woodstock, Ill.; Mrs. J. P. DeWilde, Kansas City, Mo.; Mrs. B. V. Clark, Aurora, Ill.; Mrs. G. M. Buckman, Omaha, Neb., and Mrs. Henry Loercher, Bloomington, Ill.



"This here is one of our finest 'n clearest specimens; we'd like to exhibit it!"

welcome

Standard Own

509
ALL INDUSTRY
EXPOSITION
CLEVELAND

Standard Refrigeration Co.

20 North Wacker Drive

Chicago 6, Illinois

SERVICE ENGINEER

59

October, 1946



4th All-Industry Refrigeration and Air-Conditioning Exhibition

Cleveland Public Auditorium
October 29 — November 1

SPONSORED by the Refrigeration Equipment Manufacturers Association, with the cooperation of the Frozen Food Locker Manufacturers and Suppliers Association, the 4th All-Industry Refrigeration and Air Conditioning Exhibit is the focal point for all-industry meetings being held immediately preceding or during the time of the Show.

Held in the Cleveland Public Auditorium, the nation's foremost exhibition hall, nearly 190 exhibitors occupying 75,000 sq. ft. of exhibit space and 300 exhibits, will display their products to an anticipated attendance of over 15,000.

Four-Day Schedule of Show Hours

Tuesday, October 29—12 noon to 9 p. m. Wednesday, October 30—12 noon to 10 p. m. Thursday, October 31—12 noon to 6 p. m. Friday, November 1—10 a. m. to 4 p. m.

The exposition will be open to students

and the public on Wednesday evening only from 7 to 10 p, m.

The exposition will represent the most

9.0

K. B. THORNDIKE Chairman REMA Exhibits Committee

complete display of mechanical refrigeration and air conditioning equipment for applications ranging from 150 degrees below zero to 80 degrees above zero.

Exhibit Committee

An All-Industry Show Committee has complete charge of the exhibit. Committeemen are K. B. Thorndike, Chair-H. W. Jarrow all

man, L. A. DeMore, H. W. Jarrow all of Chicago and Gene Robers, Cleveland,



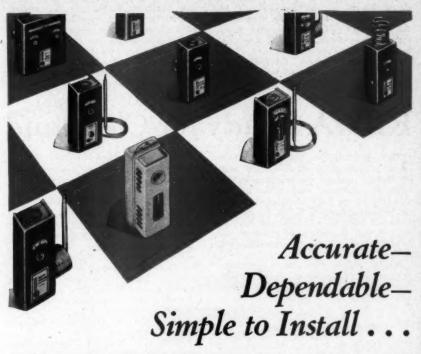
H. F. SPOEHRER



GUY J. HENRY



C. H. BENSON Secretary



THAT'S WHY WHITE-RODGERS CONTROLS ARE Specified by MANUFACTURERS... Preferred by SERVICE MEN

White-Rodgers temperature and pressure controls are so easy to install, so accurate in operation and dependable under even exceptional conditions, it will pay you to use them for every commercial refrigeration or air-conditioning application.

Manufacturers specify White-Rodgers controls because they give their products peak efficiency and customer acceptance. Service men prefer them because they eliminate installation difficulties and simplify adjustment.

For manufacturer—service man—and user, White-Rodgers controls always give complete satisfaction. Write for refrigeration control catalog and complete information.



all officials of member companies in the two associations, R. Kennedy Hanson of the Refrigeration Equipment Manufacturers Association, and R. R. Farquhar, Secretary of the Frozen Food Locker Manufacturers and Suppliers Association, are members ex officio. Mr. Hanson serves as Show Director.

Headquarters during the All-Industry Exhibit for REMA members is at the Hotel Cleveland. No meetings of REMA will be held during the Exhibit except a joint luncheon at the Hotel Cleveland of members of REMA and the Refrigeration Equipment Wholesalers Association. Headquarters of REMA are at Pittsburgh.

REWA Ready for Cleveland

THE Refrigeration Equipment Whole-salers Association will meet at the Statler Hotel, Cleveland, starting Monday, October 28. Advance reservations indicate that this will be REWA's largest meeting. On Saturday, October 26, at 9 a. m., the Board of Directors will hold their meeting. Sunday, both Manufacturers Relations and Trade Relations Committee meetings will be held at 10 a. m.

Monday, October 28, from 9 a. m. until 12 noon, has been reserved for the registration of members only. Final registration will be held on Tuesday, 9 a. m. to 11:30 a. m.

Monday Luncheon Session

On Monday, at 1 p. m., the members of the Refrigeration Equipment Wholesalers Association will meet at the Hotel Cleveland for a joint luncheon with the Refrigeration Equipment Manufacturers Association.

Tuesday Meetings

Regional meetings of wholesalers groups will occupy the morning of Tuesday, October 29, starting at 9 a. m. All regional meetings will be held at the Statler Hotel. Tuesday evening from 6:30 to 7:30 p. m., REWA will hold a cocktail party preceding the banquet at 7:30 in the Grand Ball Room.

Wednesday Meetings

The association will hold a closed meeting for members at the Statler Hotel from 9 until 11:45 a.m. The program will include: Message from President Glou.

Report, George J. Roche, Chairman, Manufacturers Relations Committee.

Report, Lem V. Branson, Chairman, Trade Relations Committee.

Report, Edw. C. Marsden, Chairman, Government Contact Committee.

Report, Alex H. Holcombe, Chairman, Finance Committee.

Report, R. E. Warwick, Chairman, Membership Committee.

Report, 10 Regional Chairmen.

(All talks limited to 10 minutes each).

Wednesday noon, the Wholesalers will have a luncheon for members and their wives.

Thursday Joint Luncheon

On Thursday, October 31, the REWA will hold another joint luncheon with REMA in the Grand Ballroom of the Statler Hotel.



TED I. GLOU President



GEO. J. ROCHE Vice-president



A. H. HOLCOMBE, JR.



HAROLD G. STERN Secretary



BUY KELVINATOR FOR ALL YOUR REFRIGERATION REQUIREMENTS

National Assn. of Refrigeration Contractors

THE National Association of Refrigeration Contractors will hold their annual meeting at the Allerton Hotel, Cleveland, Monday and Tuesday, October 28 and 29. The meetings will be open to all refrigeration contractors. Registration will start on Sunday, October 27, and business sessions will commence Monday morning, October 28. The program for Monday and Tuesday will include the following:

Monday Morning, October 28, 9:30-12:30

President's report of progress since NARC's organization January 21-22, 1946. Treasurer's report on How NARC Is Ticking.



J. F. PARK 2nd Vice-president



A. M. PALEN Treasurer

"Is Licensing the Answer?"—a discussion by Raymond J. Shock, Detroit. The talk will treat the Licensing of Employers and/or Employees; Are Inspections Enough? Some Practical Results and Possibilities.

"What NARC Means to Refrigeration Contractors"—by Ed Wright, Youngstown. Included in the discussion will be subjects pertaining to Protecting that Business Investment; Elevating the Profession; More Dollars to You; Better Satisfied Customers.

Tuesday Morning, October 29, 9:30-12:30

"Unfair Trade Practices"—a talk by Z. E. Jones, San Francisco. Contractor-Wholesaler-Manufacturer Relationships as They Affect Business Dealings; Cooperation and Profitable Operations.



W. W. FARE



M. M. JAMISON 1st Vice-president

"Why Get Together Locally? And How to Operate a Local Association"—by L. K. Brink, Los Angeles. Individual vs. Group Action. Keeping Interest and Activities Going.

Committee Reports: Trade Relations, Government Surplus, Labor Relations, Legislative, Membership, Publicity, Finance. Election of Six Directors.

Amendments to Constitution and By-Laws.

Tuesday Noon, October 29, 12:30

NARC Luncheon Meeting. Open to all refrigeration contractors, guests, ladies. Meetings of the Board of Directors will be held at 1:30 p. m. Sunday, October 27, and on Tuesday, October 29, at 6 p. m. The NARC Trade Relations Committee meeting will be held Saturday, October 26 at 1:30 p. m.

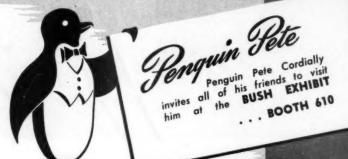


E. S. WRIGHT Recording Secretary

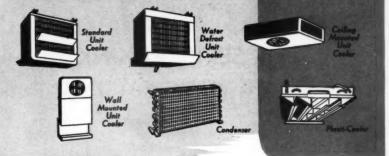


L. C. ANDERSON Sergeant-at-Arms

AT THE CLEVELAND SHOW



See the complete BUSH LINE for 1947 on display. Don't miss it. We'll be looking for you.



BUSH HEAT TRANSFER PRODUCTS

BUSH MANUFACTURING COMPANY
HARTFORD CONNECTICUT

Service Pointers

he refrigeration service engineer REFERENCE MANUALS

A COLLECTION OF

230 Selected

SERVICE "KINKS"

THE REFRIGERATION ENGINEER

Practical, Workable Ideas for use in Shop and Field Service

NICKERSON & COLLINS CO., Publishers
433 N. WALLER AVE., CHICAGO, 44

What is Frost Free Refrigeration Control?

Honeywell provides the answer with the Polartron System of Automatic Defrosting Control. — Applicable to all "above freezing" fixtures the Polartron System provides for temperature "Cut-out" and Pressure "Cut-in" operation thus assuring positive defrosting at the end of each "on" cycle. Take advantage of the full capacity built into your refrigeration equipment — use the Polartron System. See your jobber for further details. Minneapolis-Honeywell Regulator Company, 2934 Fourth Avenue South, Minneapolis 8, Minnesota. Branches and distributing offices in all principal cities.

öneywell

CONTROL SYSTEMS

Frozen Food Mfgrs & Suppliers Assn.

CO-SPONSOR with REMA in staging the All-Industry Refrigeration and Air Conditioning Exhibit in Cleveland, October 29 through November 1, the Frozen Food Locker Manufacturers and Suppliers Association will be hosts at a party on Wednesday evening, October 30 at 8:00 p. m., for members of the National Frozen Food Locker Association, as well as other locker operators and members of all associations meeting during the All Industry Exhibit

The party will consist of a humorous skit, "Frozen Scandals of 1946." It will be a satire on the locker business, written and staged by Ray Farquhar, secretary of the

locker manufacturer's association, and Wayne Carver, Des Moines. Following the play all convention visitors are invited to attend a dance in the large arena of the Cleveland Auditorium as guests of the Frozen Food Locker Manufacturers and Suppliers Association.

The directors of the association will meet on Sunday, October 27, 2:00 p. m., at the Carter Hotel, and registration of members and guests will be held at the Cleveland Public Auditorium on Monday, October 28, 10:00 a. m. A membership meeting will be held Wednesday, October 30, 9:30 a. m. in Club Room "B," at the Auditorium."

National Frozen Food Locker Association

OVER 1500 reservations have been received by the National Frozen Food Locker Association for their 7th Annual Convention in Cleveland, October 29 through November 1.

Headquarters for the association will be at the Allerton and Carter hotels with group accommodations at several other hotels

Meetings of the NFFLA will be held in the mornings in the Cleveland Auditorium where the All-Industry Refrigeration and Air Conditioning Exhibit is being shown. Senator Wherry on Program

Headlining the association's program will be Senator Kenneth Wherry of Nebraska, Republican whip, who, among other things, is noted for his recent stand against the OPA lobby. Dr. Donald Tressler, consultant and authority on frozen food processing will also be among the featured speakers.

Invitations to non-members have been extended by the NFFLA to attend some of the sessions of general interest.



ABOUT HOTEL RESERVATIONS

WHILE hotel accommodations in Cleveland will be at a premium, don't let this prevent your attendance at the show.

All cooperating associations have made arrangements with the Cleveland Housing Bureau, 511 Terminal Tower, Cleveland, Ohio to handle overflow room reservations.

This Bureau because of its experience will have a complete list of available hotel rooms as well as accommodations in private homes.



Portrait of quality

Mills Compression Equipment can be important to your performance and profit picture.

MILLS INDUSTRIES, INCORPORATED - REFRIGERATION DIVISION

4100 FULLERTON AVENUE . CHICAGO 39, ILLINOIS

Exhibitors and What They Will Display

(A black dot (*) preceding name indicates an advertiser whose current announcement can be found by referring to Index on page 112. The numeral following the name in parenthesis refers to the Booth Number. Listings as of September 5, 1946.)

• ACE ICE CREAM CABINET CO. (501), 1010 E. 173rd St., Bronx, N. Y.—Cold plates, home and farm freezers, ice cream cabinet, soda fountain.

ACME INDUSTRIES, INC. (314), Jackson, Mich.—Water cooler, oil separator, evaporative condenser, cold storage unit cooler.

• AIRCRAFT SERVICE CO. (319), 435 Melwood St., Pittsburgh, Pa.—Airserco products, testing and analysis equipment for refrigeration engineers.

● ALCO VALVE CO. (920), 865 Kingsland Ave., St. Louis, Mo.—Thermostatic expansion valves, pressure regulating valves, solenoid valves, float valves, float switches.

valves, float valves, float switches.
ALL-AMERICAN MEAT & BONE CUTTER
CO. (1202), 6151 W. 98th St., Los Angeles,
Cal.—Cutting demonstrations with meat saws.
ALL-STEEL EQUIP CO. (315), Aurora, Ill.

-Drawer and door type lockers. AMANA SOCIETY (505), Amana, Ia.-

Home freezers

THE AMERICAN BRASS CO. (609), Waterbury, Conn.—Tubing, fittings, charging hose. Demonstration of flow testing capillary tube.

Demonstration of flow testing capillary tube.

AMERICAN COILS CO. (911), 25 Lexington St., Newark, N. J.—Feature display case, air conditioner, overhead type cooling unit and other Amcoll units.

AMERICAN FLANGE & MFG. CO. INC. (119), 90 Rockefeller Plaza, N. Y. C.—Ferro-Therm steel insulation.

AMERICAN INJECTOR CO. (126), 1481
14th Ave., Detroit, Mich.—Control valves and
accessories.

AMERICAN REFRIGERATOR & MA-CHINE, INC. (711), 2700 University Ave. N.E., Minneapolis, Minn.—Freezers, frozen food display case, bottle cooler. AMERICAN SOCIETY OF REFRIGERAT-

AMERICAN SOCIETY OF REFRIGERAT-ING ENGINEERS (608A), 40 W. 40th St.,

N. Y. C.

• ANSUL CHEMICAL CO. (713), Marinette,
Wis. Refrigerants—special display.

ARCADE MFG. DIV. OF ROCKWELL MFG. CO. (207), Freeport, Ill. Refrigerator hardware.

ARMSTRONG CORK CO. (906), Lancaster,

Pa.—Insulating material.

• AUTOMATIC PRODUCTS CO. (223 & 225),

2450 N. 32nd St., Milwaukee, Wis.—A-P thermostatic expansion valves, Trap-Dri dryer, strainer, filter, Trap-it filter.

BAKER ICE MACHINE CO. INC. (506), 3601 N. 16th St., Omaha, Nebr.—Valves and fittings, high-capacity ammonia compressor. BIRO MFG. CO. (919), Marblehead, Ohlo.—

Meat cutters.

R. H. BISHOP CO. (103), Champaign, Ill.— Food freezer, atticvane fan.

**BLACK, SIVALLS & BRYSON, INC. (108), 7500 E. 12th St., Kansas City, Mo.—Relief valves, safety heads.

BONNEY FORGE & TOOL WORKS (1010),
 Allentown, Pa.—Service tools.

Allentown, Pa.—Service tools.

BOSTON TECHNICAL INSTITUTE (1119),
4707 Euclid Ave., Cleveland, O.—Courses in refrigeration instruction.

BRIDGEPORT THERMOSTAT CO. INC. (307), Bridgeport, Conn.—Bellows assemblies.

BROWN ELECTRIC CO. (207), 308 Canal St., N.Y. C.—Motor supplies.

EARLE E. BROWN ORGANIZATION (1006), 904 Rector, Los Angeles, Cal.—Locker plant equipment.

BRUNNER MFG. CO. (321 & 323), 1821
 Broad St., Utica, N. Y.—Compressors and condensing units.

BRUNSWICK - BALKE - COLLENDER CO. (904) 623 S. Wabash Ave., Chicago, Ill.

BUNDY TUBING CO. (407), 10951 Hern Ave., Detroit, Mich.—Tubing.

 BUSH MFG. CO., (610), 100 Wellington St., Hartford, Conn.—Unit coolers, plate coils, condensers, low temperature units.

BUSINESS NEWS PUBL. CO. (507), 5229 Cass Ave., Detroit, Mich.

BUTCHER BOY COLD STORAGE DOOR CO. (113), 170 N. Sangamon St., Chicago, Ill. —Cold storage doors and hardware.

D. R. CARD CO. (105), 126 S. 8th St., Minneapolis, Minn.—Locker plant record systems.
CARRIER CORP. (1109 & 1111), 300 S.
Geddes St., Syracuse, N. Y.—Compressors, colls, freezers, air conditioning equipment.

CENTURY ELECTRIC CO. (703), 1806 Pine St., St. Louis, Mo.—Demonstration of motors.

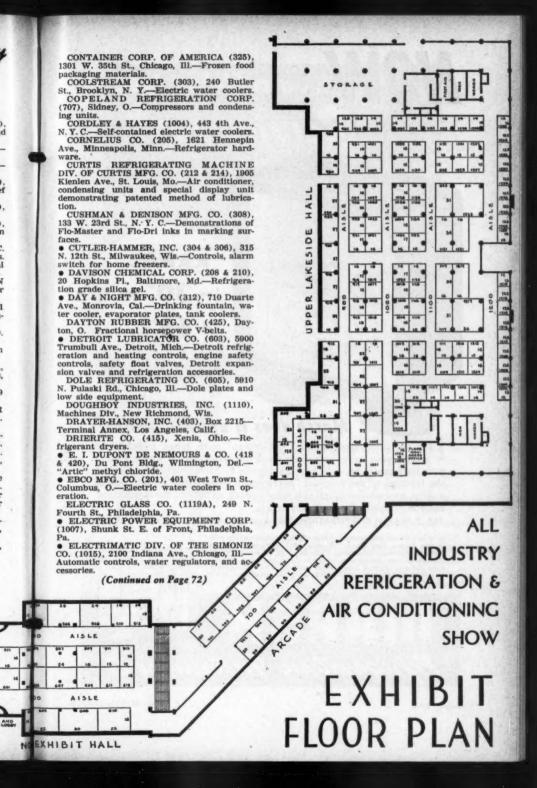
• CHICAGO SEAL CO. (502), 20 N. Wacker Dr., Chicago, Ill.—Innovations in compressor seal construction.

CHRYSLER CORP., AIRTEMP DIV. (404-6-8-10), Dayton, O.—Air conditioners, coolers, Reach-in refrigerator.

CLEVELAND REFRIGERATOR CO. (913), 6600 Sidaway Ave., Cleveland, O.

SOUTH EXHIBIT HALL

| 10 | 103 | 105 | 107 | 104 | 111 | 112 | 105 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115 | 115





IT'S the celebrated Marsh "Serviceman" with range increased to match your ever-increasing work on quick freeze units. Yes, it now indicates from -30 to +65 degrees F. Along with this it has all the features of the original "Serviceman"—the same accuracy, same utility, same ability to tell you what's going on behind the closed door. Here is a "must" for your service kit.

JAS. P. MARSH CORPORATION, 2060 Southport Avenue, Chicago 14, Illinois

* A heavy-duty precision movement, guaranteed accurate within one degree. Has Marsh "Recalibrator" to keep it accurate. Note hinged back containing bulb and 5 ft. of tubing slender enough to pass between refrigerator door and jamb. Suction cups prevent slipping and protect surfaces. The "Serviceman" is still available in ranges—10° F. to +100° F. and —20° F. to +65° F.



Refrigeration Instruments

Pagar A NAME TO REMEMBER WHEN YOU THINK OF BETTER LATHES



BACK GEARS ENCLOSED IN HEADSTOCK

PLUS PATENTED SHIFTER RACK INCREASES SAFETY AND EFFICIENCY, ADDS TO APPEARANCE OF LOGAN LATHES



SPECIFICATIONS COMMON TO ALL LOGAN LATHES . . . swing over bad, $10\frac{1}{2}^{\prime\prime}$. . . bed length, $43\frac{1}{2}^{\prime\prime}$. . . size of hole through spindle, $25/32^{\prime\prime}$. . . spindle note diameter and threads per inch, $1\frac{1}{2}^{\prime\prime}$ —8 . . . 12 spindle speeds, 30 to 1450 rpm . . . motor, $\frac{1}{2}$ thp, 1750 rpm . . ball bearing spindle mounting . . . drum type reversing mater switch and cord . . . precision ground ways, 2 V-ways, and 2 flot ways.

Logan advanced design encloses back gears in the headstock and places the Patented Shifter Rack which controls these gears on the front side of the headstock, at the operator's finger tips. There is no need to reach over the headstock, or to lean forward close to moving parts to shift the back gears. The operator avoids risk and makes the shift more easily and quickly. Here is another example of the practical designing which makes Logan Lathes outstanding in accuracy, speed, durability and safety, and in trim, clean cut appearance. For full information, see your Logan Lathe dealer, or write direct for the Logan catalog.

1-2-44

LOGAN ENGINEERING CO. CHICAGO 30, ILLINOIS

Exhibitors (Continued) and Where They Can Be Found

1600 Northeast McQUAY, INC. (701), 1600 NOTHERS Broadway, Minneapolis, Minn. MIDWEST METAL STAMPING CO. (117),

Kellogg, Ia.—Freezer trucks and trays.

MILLS INDUSTRIES, INC. (302 & 401),
410 Fullerton Ave., Chicago, Ill.—Compressors and condensing units.

MINERVA WAX PAPER CO. (512), Union Commerce Bldg., Cleveland, O.-Frozen food packaging.

• MINNEAPOLIS-HONEYWELL REGULA-TOR CO. (1014), 2753 4th Ave. S., Minneapolis, Minn.-Polartron system of frost free refrigeration, temperature controls, pressure controls, thermostats,

MINNEAPOLIS SHOW CASE & FIXTURE CO. (905A), 1009 Washington Ave. S., Min-neapolis, Minn.—Commercial cases and cool-

C. F. MOHR ASSOCIATES (112), 300 S. Highland Ave., Aurora, Ill.—Locker plant equipment.

MONSANTO CHEMICAL CO. (608), Merrimac Div., Everett Sta., Boston, Mass.—Demonstration of the application of Santocel in-

• MUELLER BRASS CO. (428), 1925 Lapeer Ave., Port Huron, Mich.—Copper pipe and fittings, valves and accessories.

• NASH-KELVINATOR CORP. (1001), 14250 Plymouth Rd., Detroit, Mich.-Condensing units, Ice cream cabinets, beverage coolers,

home freezers, refrigeration parts.
NATIONAL ASSN. OF REFRIGERATION CONTRACTORS (1105), 353 Hippodrome Annex, Cleveland, O.

NATIONAL FROZEN FOOD LOCKER ASSN. (908), 210 Old Colony Bldg., Des Moines, Ia.

NATIONAL GYPSUM CO. (613), 325 Delaware Ave., Buffalo, N. Y.—ZerOcel insulation. NEVINGER MFG. CO. (317), Greenville, Ill. NICKERSON & COLLINS CO. (104 & 106) 433 N. Waller Ave., Chicago, Ill.—Books and trade publications.

NORGE DIV - BORG - WARNER CORP. (1005), 670 E. Woodbridge St., Detroit, Mich. OWENS - CORNING FIBERGLAS (909), Toledo, O .- Fiberglas insulation.

PACIFIC LUMBER CO. (127), 35 E. Wacker Dr., Chicago, Ill.—Palco Wool insulation.

PACIFIC MFG. CORP. (219), 5308 Blanche Ave. S.E., Cleveland, O.—Air conditioner. • PEERLESS OF AMERICA, INC. (702-704), 333 N. Michigan Ave., Chicago, Ill.-Fin coils, flash coolers, air conditioning coils.

PENN BRASS & COPPER CO. INC. (1210), Erie, Pa.—Refrigeration tubing, flaring tools. PENN ELECTRIC SWITCH CO. (125). Goshen, Ind .- A new line of pressure and temperature controls not yet announced. Water valves, solenoid valves, thermostats.

PERFECTION GEAR CO. (220), Harvey, Ill.—Compressor replacement parts, water regulating valves.

H. A. PHILLIPS & CO. (1206), 3255 W. Carroll Ave., Chicago, Ill.-Float controls, injectors, control devices.

POLAR HARDWARE CO. (124), 1631 S. Michigan Ave., Chicago, Iil.—Refrigerator hardware and door gaskets.

• SANITARY REFRIGERATOR CO. (1009). Fond Du Lac, Wis.—Home and farm freezers. SCHNACKE, INC. (902), 1016 E. Columbia, Evansville, Ind.—5 to 50 hp. condensing units

and cut away models.

 SERVEL, INC. (901), Evansville, Ind. SHELLMAR PRODUCTS CORP. (305), Mount Vernon, O.—Frozen food packaging materials.

SPIR-O-FREEZ CO. (1019), 1077 Castleton

Ave., Staten Island, N. Y.

• SPORLAN VALVE CO. (431 & 433), 3723 Commonwealth Ave., St. Louis, Mo.-Expansion valves, pilot controls, refrigerant dis-tributors and strainers. New engineering manual featured.

A. E. STALEY MFG. CO. (1219), Decatur.

• STANDARD REFRIGERATION CO. (509). 20 N. Wacker Dr., Chicago, Ill.—Heat transfer appliances.

• STANGARD-DICKERSON CORP. (504), 46-76 Oliver St., Newark, N. J.-Ice cream cabinets, home and farm freezers, evaporator plates.

STERLING REFRIGERATION CO. (910), 725 Mills Bldg., Washington, D. C.—Commercial and bus air conditioner, truck refrigera-

• SUPERIOR VALVE & FITTINGS CO. (131), 1509 W. Liberty Ave., Pittsburgh, Pa.—Refrigeration and air conditioning valves and fittings, gauge manifolds, quick couplers, dehydrators, economizers, chargers.

TECUMSEH PRODUCTS CO. (710), Tecum-seh, Mich.—Condensing units and compres-

TEMPRITE PRODUCTS CORP. (327), 47 Plquette Ave., Detroit, Mich.—Cabinet type water cooler, water carbonator, combination water cooler and carbonator, instantaneous beverage and water coolers.

• TENNEY ENGINEERING, INC. (310), 26 Avenue B. Newark, N. J.—Thermostatic ex pansion valve, ice maker, unit cooler.

THE TEXAS CO. (206), 135 E. 42nd St., N. Y. C.-Demonstration of oil circulating in a

refrigeration unit under operation.

THERMAL CO. INC. (409), 2410 University Ave., St. Paul, Minn.—Refrigeration parts and equipment wholesaler.

E. W. TWITCHELL, INC. (309), Packaging Div., Public Ledger Bldg., Philadelphia, Pa.— Frozen food packaging materials.

TYLER FIXTURE CORP. (1008), Niles, Mich.—Open frozen foods case, open meat and dairy case, reach-in refrigerator, home and farm locker, beverage cooler, conventional meat case.

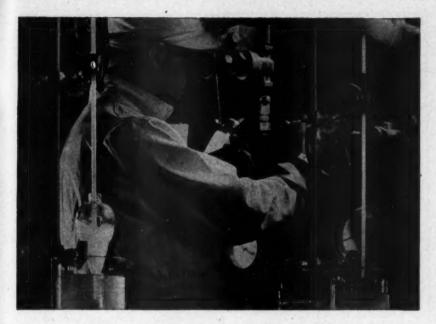
UNITED CORK CO'S. (133), 1151 Eddy St., Chicago, Ill.—Insulation.
UNITED FRIGUATOR ENGINEERS (429).

Menominee, Mich.
UNITED REFRIGERATOR MFG. CO. (511

513), 366 Wacouta St., St. Paul, Minn. UNIVERSAL COOLER DIV. OF INTERNA-

TIONAL DETROLA CORP. (129), Marion, O. Compressors and condensing units.

U. S. AIR CONDITIONING CORP. (1204), Minneapolis, Minn.—Air conditioning system, evaporative condenser, unit air conditioner, unit cooler, direct expansion coil.



He's on the Job ... to further safeguard Air Conditioning and Refrigeration Systems

This operator's "on the job" tests are the first line of defense against corrosion, oxidation, or other damage to the finely machined parts within a refrigerating system.

Several times each hour samples of "Freon" are drawn from the production line. The operator allows the "Freon" to boil away in a Goetz bulb, carefully observing the boiling point range and on the alert for any residue of impurities. His results are checked and double-checked by the same and other tests in the quality control laboratory, but this continual on-the-job control is one of the main reasons for the outstanding purity of "Freon."

The manufacture of "Freon" requires special apparatus and tremendous "know how." But it results in the ideal refrigerant, non-corrosive to machinery, harmless to humans, mechanically practical for every refrigerating need. For further details write: Kinetic Chemicals, Inc., Tenth and Market Sts., Wilmington, Delaware.

IMPORTANT When you're in Cleveland for the All-Industry Refrigeration and Air Conditioning Exposition, be sure to visit the "Freon" Booth. You'll see laboratory tests in action . . . learn how they insure the purity, dryness and uniformity of all "Freon" safe refrigerants.

IMPORTANT PEATURES OF "FREON" SAFE REFRIGERANTS

- 1. Freedom from moisture . . . less than 25 parts per million.
- 2. Narrow boiling point range—confined within limits of 1/2°C.
- 3. Less than 2% of insoluble gases in vaper phase.
- 4. Freedom from acids. There are none in "Freen."
- 5. Freedom from impurities . . . less than 1/20 of 1%.



Exhibitors (Continued) and Where They Can Be Jound

ENGINEERING SERVICE, INC. (1210), 1311 W. 80th St., Cleveland, O.—Yoder horizontal and freezer plates, stands and banks. ENRICHMENT PRODUCTS CO. (1218), 527 Fifth Ave., N. Y. C.

ESTON CHEMICALS, INC. (907), 3100 E. ESTON CHEMICALS, INC. (907), 3100 E. 26th St., Los Angeles, Calif.—Refrigerants. FEDDERS—QUIGAN CORP. (1002), 57 Tonawanda St., Buffalo, N. Y. FLEETWOOD AIRFLOW, INC. (915), Wil-

kes-Barre, Pa.—Commercial cases and coolers. FOOD LOCKER EQUIP. CO. (328), 31 E. Georgia St., Indianapolis, Ind.—Demonstration of meat grinder. Meat processing equip-

ment

FRIGIDAIRE DIV. OF GENERAL MOTORS CORP. (417 & 419), 300 Taylor St., Dayton, O. -Condensing units, evaporative condenser, cooling units. Water cooler in operation. Precision-built installation and replacement parts on display

FROSTED FOOD FIELD (405), 19 W. 44th

St., N. Y. C.
FROZEN FOOD INDUSTRY & LOCKER PLANT JOURNAL (422), 304 E. 45th St., N.

FROZEN FOOD LOCKER MANUFACTUR-ERS & SUPPLIERS ASSN. (908), 656 Insurance Bldg., Omaha, Neb.

• GENERAL CONTROLS CO. (1122), 801 Allen Ave., Glendale, Calif.—Valves, pressure and temperature controls, strainers.
GENERAL ELECTRIC CO. (228,

413), 5 Lawrence St., Bloomfield, N. J.

GENERAL ENGINEERING & MFG. CO. 1523 S. 10th St., St. Louis, Mo .- Air conditioner and cut-away section of compres-

L. H. GILMER CO. (1118), Tacony, Philadelphia, Pa.-Assortment of 50 belts.

GOODSELL CORP. (601), 6 W. Eager St., Baltimore, Md.

GOODYEAR TIRE & RUBBER CO. (1108). Pliofilm Dept. of the Chemical Products Div., Akron. O.

GRAND RAPIDS BRASS CO. (1205), Grand Rapids, Mich.—Commercial refrigerator hard-

GRIFFITH LABORATORIES (427), 1415 W. 37th St., Chicago, Ill.—Products and equipment for curing foods.

• HEAT-X-CHANGER CO. (426), Brewster, N. Y .- Liquid, soda fountain and beer coolers. Heat exchangers.

 HENRY VALVE CO. (227), 3260 W. Grand Ave., Chicago, Ill.-Refrigerant valves and

• HIGHSIDE CHEMICALS CO. (122), 195 Verona Ave., Newark, N. J.—"Thawzone" fluid dehydrant, "Trace" refrigerant leak de-

HONOR GRAND FROZEN FOOD DIV. STOKELY FOODS, INC. (1214), 5601 E. 14th St., Oakland, Calif.-Display of frozen fruits and vegetables.

ICE AIR CONDITIONING CO. INC. (708), 794 Union St., Brooklyn, N. Y.

IDEAL COOLER CORP. (211), 2953 Easton Ave., St. Louis, Mo .- Frozen food cabinet, beverage cooler, draft beer cooler.

 IMPERIAL BRASS MFG. CO. (128), 1200 W. Harrison St., Chicago, Ill.-DiaSeal Valve, Torpedo dehydrator, service tools and acces-

JACK & HEINTZ PRECISION INDUS-TRIES, INC. (102), Cleveland, Ohio.—Her-

metic compressors.

· JAMISON COLD STORAGE DOOR CO. (1112), Hagerstown, Md.—Cold storage doors.

JARROW PRODUCTS (322), 420 N. LaSalle St., Chicago, Ill.-Refrigerator door gaskets and insulation for cooling rooms and refrig-

JOLIET CHEMICALS, LTD. (1208), Industry Ave., Joliet, Ill.—Applications of Jay

Cee silica gel.

JORDAN REFRIGERATOR CO. (1219A), 235 N. Broad St., Philadelphia, Pa. KALAMAZOO VEGETABLE PARCHMENT

CO. (107), Wrapping Paper Div., Kalamazoo,

Mich.—Frozen food packaging paper.
KASON HARDWARE CORP. (203), 127
Wallabout St., Brooklyn, N. Y.—Refrigerator

• KEROTEST MFG. CO. (224 & 226), 2525 Liberty Ave., Pittsburgh, Pa.—Refrigeration and air conditioning valves and fittings.

• KINETIC CHEMICALS, INC. (316), 10th & Market Sts., Wilmington, Del.-Laboratory tests of "Freon."

KOLD-HOLD MFG. CO. (414), Lansing, Mich.—Display of plate stand, bank and liner.

Demonstrations of plates in operation.

• KRAMER TRENTON CO. (114), 626 Brunswick Ave., Trenton 5, N. J.—Demonstration working model of Thermobank automatic defrosting system.

LEHIGH FOUNDRIES, INC. (416), 143
Fountain Ave., Lancaster, Pa.—Compressors, condensing units, cut away models.

LILY-TULIP CUP CORP. (423), 122 E. 42nd St., N. Y. C .- Paper frozen food containers LINDE AIR PRODUCTS CO. (1013), 30 E. 42nd St., N. Y. C.
LINDLEY BOX & PAPER CO. (120), Mari-

Ind.-Frozen food containers.

LIVAR CORP. (209), 922 Park Ave., Balti-more, Md.—Compressor and condensing unit. LOCKER PUBLICATIONS CO. (110), 1421

Walnut St., Des Moines, Ia.

• LYNCH MFG. CO. (216 & 218), Toledo, O.-Par condensing units.

A. E. MACADAMS & CO. INC. (109), 95 Lexington Ave., Brooklyn, N. Y.—Frozen food packaging materials.

MARATHON CORP. (111), Menasha, Wis. Frozen food packaging materials. MARLO COIL CO. (602), 6135 Manchester,

St. Louis, Mo .- Lowside equipment. MASTER-BILT REFRIGERATION MFG.

CO. (712), 920 Palm St., St. Louis, Mo.-Home and farm freezers, milk coolers, beverage cooling equipment.

MASTER MFG. CORP. (215), 119 Main St., Sioux City, Ia.-Food storage lockers.

MAYFLOWER PRODUCTS, INC. (115), 13 S. 5th St., Richmond, Ind.—Condensing units, air conditioners. • MC INTIRE CONNECTOR CO. (611), 253

Jefferson St., Newark, N. J.-Driers, filters, strainers, wire mesh products.



THIS VALVE Helps you solve Installation PROBLEMS QUICKLY - ECONOMICALLY

Versatility is the keynote around which the design of the Tenney Valve is built. This versatility saves you time and money on installation or replacement jobs. Compare your time on typical installations and prove this statement. You will be the winner every time you use a Tenney TS-1

And here's another way you'll gain. You don't have to worry and fuss about locating the Tenney TS-1. Just hook it into the line wherever most convenient, and in any position-vertical or horizontal-right side up or

> upside down. Easy? You bet! Takes but a few minutes, too. See it at the Exposition, Send for Bulletin if you cannot come to Cleveland.

Visit

CLEVELAND AUDITORIUM OCTOBER 29-NOVEMBER 1

POSITIVE CONTROL

TENNEY EXHIBITS in BOOTH 310

You are cordially invited to visit our booth and see the Tenney TS-1 See the Tenney Ice Maker, Unit Cooler, and Fin Coils. There will be literature available and engineering personnel will be in attendance to answer your questions.

TECHNICAL DATA



Supersensitive power element located in suction line responds instantly to both temperature and pressure conditions-No external equalizer needed -Pressure drop in evaporator or distributor is automatically componsated - Eliminates

"charges" and "cross-charges"-Range-Va ton to 11/2 tons capacity—Closes above a definite evaporative pressure, without use of cartridges or other auxiliary equipment—Extremely close superheat control-Complete absence of time lag in control-Not affected by box temperature, entering warm air, or warm suction lines.

SEND FOR BULLETIN TV 46



ENGINEERING,

Telephone: BIGELOW 8-3905 Manufacturers of Automatic Temperature, Humidity and Pressure Control Equipment

Exhibitors-Concluded

QUICK FROZEN FOODS (217), 82 Wall St.,

QUILLEN BROTHERS REFRIGERATOR CO. (1011), 1639 Lafayette Rd., Indianapolis, -Farm and home freezers.

RAMSEY-BENNET CO. (318), 430 Huron

Rd., Cleveland, O.

RANCO, INC. (324 & 326), 601 W. Fifth Ave., Columbus, O.—Household and commercial refrigeration controls.

REDMOND CO. INC. (221), Owosso, Mich. REFRIGERATION APPLIANCES, INC. (118), 923 W. Lake St., Chicago, Ill.

REFRIGERATION CORP. OF AMERICA (508-10), 103 Park Ave., N. Y. C.—Locker plant equipment, farm and home freezers.

REFRIGERATION ENGINEERING CO. (1207), 211 Foshay Tower, Minneapolis, Minn. REFRIGERATION EQUIPMENT WHOLE-SALERS ASSN. (607A), 920 E. McMillan St., Cincinnati. O.

REFRIGERATION PUBLICATIONS, INC.

(708), Cleveland, O.

REFRIGERATION SERVICE ENGINEERS SOCIETY (607B), 433 N. Waller Ave., Chicago, Ill.

ROGERS DIESEL AND AIRCRAFT CORP. (709), 1120 Leggett Ave., N. Y. C.-Cooling chemical dehumidification units.

ROTARY SEAL CO. (311), 2020 N. Larrabee St., Chicago, Ill.-Replacement seal units and assemblies.

SAFE-WAY FOOD LOCKER CO. (123), 175 W. Jackson Blvd., Chicago, Ill.—Food lockers. SALEM ENGINEERING CO. (320), Salem, O .- Working model of locker plant and freezing equipment for commercial food packing. UTILITIES ENGINEERING INSTITUTE
(1107), 1314 Belden Ave., Chicago, Ill.—
Courses in refrigeration instruction.

VIRGINIA SMELTING CO. (116), West
Norfolk, Va.—Refrigerants for food preservation and Aerosols for food sanitation.

WARASTI MEET.

WABASH MFG. CO. (424), 2700 S. Michigan Ave., Chicago, Ill.—Replacement parts and service tools.

WALLIS NO-AIR WRAP SYSTEMS (905), Walker Bank Bldg., Salt Lake City, Utah. WEATHERHEAD CO. (301), 300 E. 131st

Cleveland, O.-Refrigeration valves and fittings.

WEBER SHOWCASE & FIXTURE CO. INC. (222), 5700 Avalon Bivd., Los Angeles, Calif. Frosted food and ice cream cabinets.

GEORGE M. WESSELS CO. (101), 5225 Wilshire Blvd., Los Angeles, Calif.—Promo-tional and advertising material for the locker

WESTINGHOUSE ELECTRIC CORP. (204), 653 Page Blvd., Springfield, Mass.-Water coolers, milk coolers

WHITE-RODGERS ELECTRIC CO. (213), 1209 Cass Ave., St. Louis, Mo.—Temperature and pressure controls.

WHITNEY BROTHERS, INC. (1212), Frozen Food Packaging Div., 34 Farnsworth St., Bos-

ton, Mass.—Frozen food packaging materials.
WOLVERINE TUBE DIVISION (313), 1411
Central Ave., Detroit, Mich.—Demonstration of condensing units comparing plain tubes with Trufin tubes. Display of copper and brass tubing products.
YORK CORP. (604), Roosevelt Ave., York,

Cylinder Shortage is Refrigerant Bottleneck

M ANUFACTURERS claim that production of all refrigerants is ample to provide for requirements of the field; however, the cylinder shortage presents a critical problem. During the war, a concerted effort had to be made to keep cylinders in free circulation to avoid serious repercussions. THE SITUA-TION AGAIN IS SERIOUS.

The answer is to return cylinders to your wholesaler as quickly as possible, if you would avoid being unable to get refrigerants.

You Must Help

Cylinders should be returned as promptly as possible to avoid a shortage. Slow return and hoarding cylinders will bring you serious difficulties.

The recent steel strike was re-sponsible to a large extent for the delay in deliveries of cylinders ordered by refrigerant manufacturers. It is quite likely that some im-provement may be noted, but not until the latter part of this year, or early next year.

Because of the critical shortage existing in small cylinders of 5, 10, 20 and 35 pounds, service engineers have been ordering refrigerants in larger cylinders and consequently this has created a shortage not only in the smaller but in the larger sizes as well.

Recently, the National Associa-tion of Refrigeration Contractors, recognizing that Freon shortage was progressively growing worse, wired Kinetic Chemicals urging that full pressure be brought on the Civilian Production Administration for the necessary priorities to ac-celerate cylinder production.

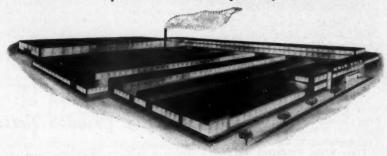
But for the present, the only solution to the situation is that the existing supply of all sizes of cylinders must be kept in circulation con-

stantly.

Do Your Part

KOLD-HOLD expands again!

More and Better Kold-Hold Plate Evaporators
Will Flow from this Newly Acquired Plant



REMA CONVENTION
Oct. 28 to 31
Cleveland, Ohio
Booth 414

With this announcement Kold-Hold fulfills a promise for postwar...a million-dollar plant to meet pressing demands created by the hundreds of new uses developing for versatile Kold-Hold evaporator plates and liners.

Kold-Hold's new plant more than triples former manufacturing space. Personnel has been

greatly expanded . . . new methods of production have been perfected . . . new machinery added. Today, under one roof . . . from sheet steel to famed finished product . . . Kold-Hold is producing a steady flow of better-than-ever units.

Standard Kold-Hold units are extremely versatile. The plates can be mounted separately on wall or ceiling, or combined in plate stands, banks and racks. Ideal for locker plants, sharp-freeze or cold storage rooms because they weigh less, mount flat, provide maximum cooling from minimum size plates. Wherever there's a freezing or cooling problem, there's an application for Kold-Hold plates or liners.

JOBBERS IN PRINCIPAL CITIES



Refrigeration Service Engineers Society



Official Announcements of the activities of the International Society and Local Chapters appear in this department as well as articles pertaining to the educational work of the Society.

INTERNATIONAL HEADQUARTERS: 433-435 North Waller Ave., Chicago 44, Ill.

COMING CONVENTIONS

RSES Convention
Place: Hollenden Hotel.
City: Cleveland, Ohio.
Date: October 26, 27, 28, 29, 1946.
Secretary: H. T. McDermott, 483 N.
Waller Ave., Chicago 44, Ill.

All Industry Exhibition:
Place: Cleveland Public Auditorium.
City: Cleveland, Ohio.
Date: Oct. 29 to Nov. 1.
Exec. Secretary: R. Kennedy Hanson,
1107 Clark Bldg., Pittsburgh, Pa.

Alabama State Meeting
Place: Whitley Hotel.
City: Montgomery, Alabama.
Date: December 2, 8.
Secretary: W. C. Goodwin, 14 Country Club Drive, Montgomery, Alabama.

New England State Meeting City: Providence, Rhode Island. Date: Sunday, November 17. Secretary: Lee J. Wallace, 29 Cave St., New Haven, Conn.

lowa State Meeting
City: Davenport, Iowa.
Date: January 25, 26.
Secretary: Clarence Brashaw, 385 Main
St., Dubuque, Iowa.

x x x

IOWA STATE ASSOCIATION FORMED

ON AUGUST 4th representatives of the various chapters in the state of Iowa met in Waterloo for the purpose of considering the formation of a State Association. Those in attendance were: Erwin Meyer, Davenport; Leonard Hanson, Davenport; Donald Riggs, Waterloo; Richard Herbert, Waterloo; H. G. Brewster, Des Moines; Clarence Brashaw, Dubuque; R. P. Narr, Dubuque, and Robert Miller, Dubuque.

One of the first orders of business was the election of a Temporary Chairman. Erwin Meyer of Davenport was elected Chairman and Dick Herbert of Waterloo, Secretary. After some discussion on the advantages to be gained from a State Association, a motion was passed to the effect that the Association be formed. Erwin Meyer was then elected President of the newly formed group: H. G. Brewster, 1st Vice-president; and Clarence Brashaw, Secretary-Treasurer, to hold office until the first convention. January 25th and 26th, 1947, were set for the dates of the first state meeting, with Davenport accepted as the convention city.

R.S.E.S. Chapter Notes

• CENTRAL CONNECTICUT CHAPTER, Hartford, Conn.—In March the City of Hartford instituted a parking program that would relieve congestion in the central area of the city. This new policy caused a hardship on the servicemen as many parking tags were being handed out to them under circumstances that were not fully understood. After meeting with the Hartford Police Chief, this chapter's committee was given permission to print a card that would be used for emergency purposes only. To date the members have not abused this privilege granted and their work has not been interrupted.

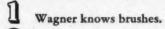
The meetings for the months of May and June were routine, dealing with ordinary events followed by adjournment for refresh-

ment

The July meeting was devoted to open house and the prospective new members were guests. Eleven new members were added to the chapter. Plans were discussed for an early fall outing and a committee was designated to investigate this matter. Plans were also discussed for a fall dinner dance and this matter was turned over to Stan Urban as a committee of one to plan. The date set was Columbus Day, October 12.

- ◆ CHARLESTON CHAPTER, Charleston, W. Va., August 13—Upon completion of the usual routine of business, Chairman of the Entertainment Committee, Mr. Rupe, introduced the visitor of the evening, C. C. Allen of Henry Valve Co. His subject was the development of porous bronze refrigerant filters soon to be placed on the market by Henry Valve. The topic of discussion then turned to thermostatic expansion valves in air conditioning and refrigeration applications. Mr. Allen aided in this discussion.
- ELM CITY CHAPTER, New Haven, Conn., Aug. 2—Roll call, and we were on our way





For 55 years Wagner has used more brushes in repulsion induction brush lifting type motors than any other manufacturer.

Wagner is free to select the "Cream of the Crop" and does so without prejudice.

Brushes furnished in Wagner motors and as replacement parts will result in maximum commutator and brush life. This may not be true of so-called "Equivalent Grades": Avail yourself of Wagner's experience.

These Brushes are Available for Immediate Delivery

Wagner designs and builds each motor part to assure dependable service for which Wagner motors are world-famous.

When it's a Wagner motor, be sure to put in genuine Wagner motor parts—available at 325 authorized service stations displaying this sign.





M46-23A





Electric

6433 Plymouth Avenue • St. Louis 14, Mo., U.S.A.



for an interesting time (as usual); and no dull moments. Minutes read, and accepted too! One new application received and entered for consideration. Report was given on the Fairfield County Chapter Outing, which some of our boys enjoyed. It seems that Freddie "Poker Face" Montesanto did especially well! The story is that the Bridgeport boys sort of took our boys over the hurdles last year at our outing. Freddle not only re-deemed himself but did well enough to make all our boys happy. But Fred didn't consider it amusing when a suggestion was made that his winnings be used to reinforce the Treasury. He stoutly maintained it took too much hard work, and his earnings were all his own. The matter was "quietly" dropped and final plans for our outing were settled. "Frank Morley was heartily welcomed back into the fold after a long seige of illness. He promises to lay off that brand now, for good too! Anyway that wasn't the cause 'Nowhow.' Meeting adjourned for refreshments of 'Dagwoods 'n Beer.' A movie 'Removing and Installing a Cooling Unit' followed. A most interesting showing was given and our projectionist gave us a hilarious time. We have a pretty special machine which enables the operator to stop; start and reverse at will. Upon the completion of the picture the operator reversed the machine and you should have heard the language! It made it appear as if the customer thought the bill too high and 'Old Sulph' the mechanic decided to put the old parts back.

August 11—"About 70 members and some guests assembled at Restland Farms, Northford, for the Annual Outing. Quite a fine gathering and can't say I heard any complaints. The morning saw a baseball game, 'Barnyard Golf' (horse-shoes to you laymen) and several card games. A repast we'll long remember was served at 2:00 P.M. It consisted of tomato juice, chowder, fried chicken, salads, corn 'a la typewriter,' all the little delicious things, with ice cream and cake as the finale. The 'indigestion' was worked off with more baseball, cards and 'ringers.' Highlight of the day: 'Buck' Bendel give us a buck for chances on a new carl—"I'll raise you one.'—"Those four out innings and five strike batters in the second game.'—"Kill the umpire'—'Who is the ump, anyway?"

Florida West Coast Chapter received its charter August 19 at a banquet held at the Las Novedades Restaurant. The charter was presented by J. D. Nall, President of Miami Chapter.

Pictured above, left to right, at the speakers table are Mrs. George Mitchell, Mr. George Mitchell, Mrs. F. M. Carryl, Mr. F. M. Carryl, Mrs. W. A. Bingham, Jr., Mr. W. A. Bingham, Jr., Mr. James D. Nall, W. A. Bingham, Sr., Mr. J. E. McGraw, Mrs. J. E. McGraw, Mr. H. B. Adams, Mrs. H. B. Adams and Mr. Sam Graziano.

"In spite of aching joints, sunburned backs and 'enlarged' heads everyone had the time of his life, even if the Bridgeport boys did walk out with most of the prizes. Guess that will hold us 'till next year."—Reported by Lester H. Harris, Publ. Chairman.

- FAIRFIELD COUNTY CHAPTER, Fairfield County, Conn., Aug. 12—During the business activities of the evening, Earle M. Rover, Milton L. Hedberg, Leo V. Nolan and Zeno Schirmer were accepted as active members. Mrs. Harvey Lockwood was appointed Asst. Secretary and Richard Chase, President, was elected delegate to the National Convention. Members were informed that the Elm City Chapter is to be invited to the October meeting to be held at Bridgeport.
- FLORIDA WEST COAST CHAPTER, Tampa, Fla., Aug. 9—The entire evening was devoted to business routine, during which a discussion was held on rates of charges for service work. It seemed to be the unanimous opinion of those present that these rates should be increased and after settling on a definite scale, including a mileage charge, it was decided to start the new rate August 15. August 19—The charter was presented to

August 19—The charter was presented to the chapter by J. D. Nall with about 79 members and guests in attendance. There were 33 members scheduled to take the obligation of membership and 30 were in attendance at the meeting. Mr. Nall was the principal speaker and considerable enthusiasm of the work of the chapter was shown by the members present.



rs el.

riir, ios. t. as n. yt-

e-s-v-is a it it in the in-

● FOX RIVER VALLEY CHAPTER, Fond du Lac, Wis., Aug. 7—During the meeting the Treasurer's report was read and a discussion held on the possibility of holding a Ladies Night in the near future. Two new committees were announced with George Thuerwachter heading the Educational Committee and Floyd Roe the Entertainment Committee. Some time was spent in general discussions, then the meeting was adjourned.

On September 4th following the business

On September 4th following the business session Mr. Kenny of Busch Mfg. Co. gave an interesting educational talk on the proper

application of Busch products.

- LA CROSSE CHAPTER, La Crosse, Wis., Aug. 2—President Sargent discussed business to be presented at the State Board of Divotors Meeting at Stevens Point, August 3rd. Membership of the chapter was informed that the unions were organizing the servicemen of the area but as yet no decision has been made as to which branch the men would be affiliated. It is expected that a representative of the union would attend a future meeting. The program committee presented educational film No. 446, "Checking the Electrical System." An interesting talk covering motors and motor control followed. The membership felt the film was interesting but rather fundamental for the majority of the members.
- LONG BEACH CHAPTER, Long Beach, Cal., July 10—Demi Voorhis reported for the Entertainment Committee on the prospects for a deep sea fishing tour and a tentative date was set. A number of out-of-town visitors were present for the evening, including R. L. Héndrickson of the Refrigeration Service Engineer, who talked briefly on the production of a monthly publication. On the educational program Mr. Willis introduced Mr. Taylor of Techno Electric who in turn gave a very interesting talk on electric motor repair and maintenance.
- MEDINA CHAPTER, Medina, O., Aug.— After the reading of minutes and usual business routine, applications for membership as follows were read and approved: Lawrence N. Abbott, Kenneth W. Hunt, Carl Herbert Dannemiller and Norman B. Abbott.
- MIAMI CHAPTER, Miami, Fla., Aug.—Recent reports from members in the area show that Karl R. Sundman is the father of newly arrived twins—a girl and a boy. Another new father in the chapter is Orville W. Brown—a little girl. It has also been reported that R. D. Smith, an associate member of the chapter, is gravely ill at his home. He has been greatly missed by the members for the past several months and everyone is hoping that he will get well soon.
- MOTOR CITY CHAPTER, Flint, Mich., Aug. 13—The future bowling league came in for a good deal of discussion by the Entertainment Committee. Four representatives of the Ferro Therm Steel Insulation were present. Mr. Chapman, Mr. Kropic, Mr. Conroy of the Chapman Kellar Co. of Detroit, and Mr. Rognlie of the Reflective Steel Insulation Co. of Detroit. These gentlemen gave a very interesting and instructive talk on the use and the installation of Ferro Therm steel insulation in coolers of all types.

- NEW BRUNSWICK CHAPTER, New Brunswick, Can., June 1.—Upon conclusion of the business session for the evening the meeting was adjourned in favor of a dinner, at which the guest speaker was Harry Parrish, Editor of The Canadian Refrigeration Journal, Toronto. Mr. Parrish spoke on locker plants and low temperature applications as it applies to the refrigeration service engineer. His address was both interesting and instructive.
- OLD BALDY CHAPTER, Pomona, Cal., Aug. 19—The newly formed Old Baldy Chapter received its charter in an official presentation at a dinner meeting in the Chungking Cafe. The chapter enjoyed the membership of 25. The charter presentation was made by W. W. Allison, member of the International Board of Directors. Officers of the newly formed chapter are Stillman Peck, President; H. B. Hollingsworth, 1st Vice-president; Hal Crumly, 2nd Vice-president; D. R. Smith, Secretary-Treasurer; J. R. Wilcoxson, Sergeant-at-Arms. Board members—J. T. Dickey, Albert Boyer, E. E. Marsh, V. T. Cleveland and R. H. Patterson. "The educational advancement of the Society is one of the primary objectives," stated Mr. Allison in his address before the gathering.

J. C. Blair, instructor in refrigeration at the Wiggins Trade School, reviewed benefits to be derived through membership. W. C. Irving, Santa Monica, Chairman of the Educational Committee in the State Association, called attention to the growth of the Society in the state and nation. Others who spoke were Pat Riley, president of the Long Beach Chapter, Stewart Bell, representative of Allied Refrigeration Co. and member of Long Beach Chapter, Ira Hammer, representative of Refrigeration Supply Distributors and member of Long Beach Chapter, and Merle Stutsman, Mgr. of RSD and member of Long Angeles

Chapter.

- ROCKFORD CHAPTER, Rockford, Ill., Aug.—"Rockford Chapter Annual Picnic was a success, with a good turnout of members, also visitors from Madison and Milwaukee, Wis. In the annual ballgame Madison Chapter defeated Rockford Chapter 16 to 5. It seems that old age had to give way to youth as the Rockford fielders had a little trouble in bending down—also the writers pitching didn't seem to fool the Madison squad as it has in the past."—Reported by Earl J. Seaton, Secy.
- SAN DIEGO CHAPTER, San Diego; Cal., Aug. 15—The meeting was held at the California Electric Works, after it was discovered at the last minute that the regular meeting place could not be used. George Coombs of Calewo saved the day by offering the use of his firm's facilities. One new member was added to the chapter and another application for membership was read and turned over to the Membership Committee for report. Future plans for entertainment were discussed and after completion of the business meeting, W. A. Remark of Nash Kelvinator spoke briefly on apartment house conversion and replacement. C. E. Anderson, Educational Chairman, presented two films of the series and after discussion and comment he also gave a showing of beautiful and interesting colored movies he had taken in Mexico City. Refresh-



The DFN system gives you a threeway weapon against moisture, sediment and acid—saves you servicing time and prevents expensive "make-good" call backs due to freezeups, stuck valves and clogged system. The very compactness and completeness of the DFN cartridge makes it also the easiest to replace. For this cartridge is quickly inserted in the DFN shell without fuss, muss or loss of dehydrating strength.

The DFN cartridge stays on the line longer because it is quality-built throughout. The drying agen is thoroughly reactivated, hermetically sealed and mechanically packed to provide complete dispersion of the refrigerant. Multiple layers of bronze wool, wool felt and strainer hold more sediment without pressure drop, and filter to minute size. Ask your distributor or write us for catalog R-7. McIntire Connector Co., 255 Jefferson St., Newark 5, N. J.

Be sure to visit Booth 611 at the All-Industry Show, Cleveland, Oct. 29-Nov. 1.



OFN

PILTERS
NEUTRALIZES

DEHYDRATORS • STRAINERS

FILTERS . NEUTRALIZERS

ments were served after the meeting to all present.

 SPRINGFIELD, MISSOURI, CHAPTER, Springfield, Mo., Aug. 28—On the educational program of the evening Harry Hoffman, Chairman of the Educational Committee, in-Charman of the Educational Committee, introduced Al Sawyer of Dole Refrigerating Company, Chicago, and Jerry Wilkerson of the same company in St. Louis. Mr. Sawyer gave an illustrated talk on how Dole plates are made and included many valuable pointers on their application. Forty-two of the fifty members in the chapter were present at the meeting.

• TWIN CITIES CHAPTER, Minneapolis, Minn., Aug. 8-The meeting was held at the Westinghouse Repair Shop in Minneapolis. Norman Sulness reported on the success of the annual picnic which showed a profit even though it was not the intention of the chapter to make money from the affair. Apparently the ticket sale was greater than anticipated and help from business concerns in the industry added much to its success. Mr. Roach of Westinghouse took over the educational program and his first item of interest was a film on commutators and their maintenance. Immediately following the film members were separated into groups and escorted into the repair shop by Westinghouse guides. The coil winding machine, high frequency coil test-ing machine, diametric balancing of rotors and large commercial switchboards were demonstrated. The members learned much from this trip.

Educational Sound Films Schedule of Showings

NDER the supervision of the International Educational Committee, a set of 16 sound films, grouped into 12 showings and accompanied by a set of slides, are being circulated among chapters as a part of their educational program. Films are all of a practical nature on servicing refrig-erating systems. Titles of the films and their identifying numbers and the schedule of showings are listed.

Film Titles and Key Numbers

No.

TITLE

360 Principles of Refrigeration 438 Checking The System—Part I 439 Checking The System—Part II

440 Locating and Repairing Leaks
 441 Adding or Removing Refrigerant
 442 Removing and Installing A Compressor or Condenser

443 Removing and Installing A Cooling Tinit

444 Adjusting and Checking The Expan-sion Valve 445 Checking and Replacing A Float Valve

Valve
446 Checking The Electrical System
447 Quieting A Noisy Refrigerator
448 Adjusting and Repairing The Thermo-Expansion Valve
451 Servicing Water Cooled Condensers
449 Adjusting Pressure Actuated Tem-perature Controls
450 Adjusting Commercial Thermostatic
Controls
452 Making and Repairing Tubing Con-

452 Making and Repairing Tubing Con-nections

SCHEDULE OF SHOWINGS

AKRON, OHIO-Akron Chapter: November 13—No. 452. Contact Claude L. Wall, 23 Grand Ave., Akron 2, Ohio.

AURORA - ELGIN - JOLIET. ILL.—Tri County Chapter: October 19-No. 445. November 16—No. 446. Contact William J. McCarley, 607 N. Center St., Joliet, Ill.

BALTIMORE, MARYLAND Monumental Chapter: No-vember 13-No. 360. Contact George J. Roche, Roche Hull Appliance Corp. 1029 Cathedral St., Baltimore, Md.

BATON ROUGE, LA.—Louis-iana Chapter: November 1 -No. 446. Contact A. E. Kaiser, Sr., Acme Refrigeration Service Co., 1670 North St., Baton Rouge, La.

BIRMINGHAM, ALA. - Birmingham Chapter: October (?)—No. 442. Contact C. S. Tucker, 2405—12th Ave. Tucker. No., Birmingham, Ala.

BLOOMINGTON, ILL.—Corn Belt Chapter: November 13 No. 449-450. Contact Harold Mason, 306 W. Wood

St., Bloomington, Ill. CHARLESTON, W. VA Charleston Chapter: November 12-No. 445. Contact H. G. Frame, Washington St. W., Charleston 2, W. Va.

CHICAGO, ILL.-Chicago Chapter: November 12—No. 447. Contact D. D. Orr, 332 S. Hoyne Ave., Chicago, Ill.

CLEVELAND, OHIO—Cleve-land Chapter: November 12 -No. 440-441. Contact Robert Whitney, % Williams & Co., Inc., 3700 Perkins Ave., Cleveland 14, Ohio.

COLUMBUS. OHIO-Columbus Chapter: November 13
-No. 447. Contact H. Grossman, 22 W. Naghten St., Columbus, Ohio.

DAVENPORT. IOWA - Mississippi Valley Chapter: November 5 — No. 448-451. Contact J. Vinje, 529 W. Second St., Davenport, DAYTON, OHIO - Dayton Chapter: November 14-No. 448-451. Contact R. E. Warner, % Allied Supply Co., 359 Monument Ave., Dayton, Ohio.

DENVER, COLO.-Mile High Chapter: October 21—No. 446. Contact R. C. Kimmel, 1524—15th St., Denver 17,

DULUTH, MINN. - Head of the Lakes Chapter: November 4-No. 438-439. Contact C. A. McCafferty, 7 N. 20th Ave. W., Duluth, Minn.

DUBUQUE, IOWA-Key City Chapter: November 6-No. 447. Contact R. E. Mueller, Stampfer Farm & Home Store, 7th & Iowa, Dubuque, Iowa.

EVANSVILLE, IND.—Evans-ville Chapter: October 31— No. 445. Contact C. E. Goad, 11 Main St., Evansville, Ind.

FLINT, MICH.-Motor City Chapter: November 12— No. 440-441. Contact Wil-bur Henderson, 3305 Gratiot, Flint 3, Mich.



Mail Coupon for Full Information -

DISTRIBUTOR for the MANUFACTURER

— 308 Ganal St., New York 13, New York

—1008 Race Street, Philadelphia 7, Penna.

— 700 Murphy Ave., S.W., Atlanta, Georgia

Brown Electric Company Department RS 308 Canel St., N. Y. C. 13, N. Y. Gentlemen: Kindly send a copy of your Catalogue No. 6 to

Name

Address

City..... Zone..... State.....

en p-

t-ed n-eh

al a c. e e il t-

FORT WORTH, TEXAS— Cow Town Chapter: November 14—No. 445. Contact P. D. Cato, Texas Refn. Supply Co., 1410 Commerce St., Fort Worth, Texas.

FRESNO, CALIF.—Fresno Chapter: November 14— No. 443. Contact N. N. Leas, % Cond. Air & Refn. Co., 249 N. H St., Fresno 3, Calif.

GRAND RAPIDS, MICH.— Furniture City Chapter: November 5—No. 447. Contact M. D. Thiebout, % Consumers Power Co., 450 Market St. S.W., Grand Rapids, Mich.

HARTFORD, CONN.—Central Conn. Chapter: October 28 —No. 438-439. Contact Stanley N. Baldwin, % Joseph Simons Co., 271 Sheldon St., Hartford, Conn.

HUNTINGTON, W. VA.—Tri State Chapter: November 12—No. 446. Contact A. W. Albertsen, 314 Eleventh St., Huntington 14, W. Va.

INDIANAPOLIS, IND.—Indianapolis Chapter: Oct. 8 —No. 360; Nov. 12—Nos. 438-439. Contact H. W. Hoffmeyer, 1422 Leonard St., Indianapolis 3, Ind.

JACKSON, MISS.—Magnolia Chapter: October 23—No. 440-441. Contact A. E. Shafer, P. O. Box 1509, Jackson 112, Miss.

KANSAS CITY, MO.—Kansas City Chapter: November 6 —No. 448. Contact C. R. Visger, 7715 Brooklyn, Kansas City, Mo.

LA CROSSE, WIS.—La Crosse Chapter: November 1—No. 440-441. Contact George Brenstein, 408 Copeland Ave., La Crosse, Wis.

LANSING, MICH.—Wolverine Chapter: October 28—No. 447. Contact R. Kellogg, 616 Jessop Ave., Lansing, Mich.

LIMA, OHIO—Lima Chapter: October 17—No. 442. Contact Allied Supply Co., Attn. Dan Shively, 122 S. Union St., Lima, Ohio.

LOGAN, UTAH—Utah Aggie Chapter: November 6—No. 442. Contact J. Cecil Sharp, % Utah State Agricultural College. Logan. Utah.

% Utah State Agriculture College, Logan, Utah. LONG BEACH, CALIF.— Long Beach Chapter: November 13—No. 444. Contact Van's Supply, 250 E. 12th St., Long Beach, Calif.

LOS ANGELES, CALIF.—Los Angeles Chapter: October 30—No. 443. Contact Merle F. Stutzman, 3464 W. First St., Los Angeles 4, Calif. LOUISVILLE, KY.—Colonels Chapter: October 17—No. 447. Contact J. M. Berry, % F. H. Lagsenkamp Co., 339 W. Main St., Louisville 2. Ky.

MADISON, WIS. — Madison Chapter: November 14— No. 448. Contact Refrigeration Maintenance Corp., Attn. Lee A. Miles, 731 University Ave., Madison 5, Wis.

MARION, IND.—Central Indiana Chapter: October 16—No. 360. Contact Francis Holloway, 704 Whites Ave., Marion, Ind.

MIAMI, FLA.—Greater Miami Chapter: October 24—No. 442. Contact Orville W. Brown, 1044 N. W. 65th St., Miami 38, Fla.

MONTEREY, CALIF.—Monterey County Chapter: November 13—No. 442. Contact Robert McDonald, 560 Fremont Ave., Monterey, Calif.

MONTGOMERY, ALA— Montgomery Chapter: October 21—No. 445. Contact J. B. Harris, % Alabama Power Co., 111 Dexter Ave., Montgomery, Ala.

Montgomery, Ala.

NEW HAVEN, CONN.—Elm
City Chapter: November 8

—No. 445. Contact T. B.
Howell, United Illuminating Co., 221 George St.,
New Haven, Conn.

OMAHA, NEBR. — Missouri Valley Chapter: October 17 —No. 443. Contact C. M. Flohr, % United Motors Service, 27th Ave. & Harney St., Omaha, Nebr. PEORIA, ILL.—Illinois Val-

PEORIA, ILL.—Illinois Valley Chapter: November 8— No. 444. Contact Bryson Roth, 300 S. Washington St., Peoria, Ill.

PORTLAND, ORE.—Multnomah Chapter: October 17— No. 442. Contact Wayne C. Miller, % Minneapolis Honeywell Regulator Co., 122 N. E. Broadway, Portland, Ore.

READING, PA.—Reading Chapter: October 17—No. 444. November 7—No. 440-441. Contact O. A. Larson, % Larson Supply Co., 326 Buttonwood St., Reading, Pa

ROCKFORD, ILL.—Rockford Chapter: October 21—No. 447. Contact L. L. Sturch, 1915 Vernon St., Rockford, III.

SACRAMENTO, CALIF.— Sacramento Valley Chapter: November 7—No. 444. Contact George M. Bale, % Assoc. Refr. & Equipment Co., 1717 Eye St., Sacramento 14, Calif.

mento 14, Calit.

ST. PETERSBURG, FLA.—
Sunshine City Chapter: November 5—No. 443. Contact R. B. Schroeder, Florida Power Corp., St. Petersburg 1, Fla.

SALT LAKE CITY, UTAH— Beehive Chapter: September 31—No. 444. Contact W. W. Walker, % G. E. Supply Corp., 310 W. 2nd South St., Salt Lake City, Utah.

SAN DIEGO, CALIF. — San Diego Chapter: October 17 —No. 443. Contact C. E. Anderson, 209 West E St., San Diego 1, Calif.

SAN FRANCISCO, CALIF.— Golden Gate Chapter: October 24—No. 442. Contact Ray Winther Co., Attn. George N. Eskra, 1245 Folsom St., San Francisco 3, Calif.

SANTA ANA, CALIF.—Orange County Chapter: October 17—No. 440-441. Contact R. L. McCain, 615 E. Bishop St. Santa Ana. Calif.

Bishop St., Santa Ana, Calif. SCRANTON, PA. — Scranton Chapter: November 6—No. 442. Contact W. D. Franklin, 1632 Sanderson Ave., Scranton 9. Pa.

SPRINGFIELD, MASS.— Western Massachusetts Chapter: September 24— No. 443. Contact Harold C. Lambert, Room 449, 31 Elm St., Springfield 3, Mass.

SPRINGFIELD, MO.—Springfield Missouri Chapter: October 30—No. 438-439. Contact Harry G. Hoffman, Hoffman Supply Co., 810 Boonville Ave., Springfield, Mo.

TOLEDO, OHIO—Greater Toledo Chapter: November 13—No. 443. Contact Paul D. Sizer, P. O. Box 69, 1216 Adams St., Toledo, Ohio. TRENTON, N. J.—Trenton Chapter: October 16—No.

TRENTON, N. J.—Trenton Chapter: October 16—No. 360. Contact Harry H. Jaeger, 216 S. Warren St., Trenton, N. J.

TULSA, OKLA.—Oil Capital Chapter: September 30— No. 447. Contact K. G. Wight, % K & M Supply Co., 209 N. Denver, Tulsa 3. Okla.

WATERLOO, IOWA.—Cedar Valley Chapter: October 23 No. 446. Contact J. Adams, % Herbert Refrn., 710 Lafayette St., Waterloo, Iowa.

WILKES-BARRE, PA.—Wyoming Valley Chapter: November 11—No. 442. Contact A. Reese, 104 Slocum St., Forty Fort, Pa.

"DUO-VANE"

COLDSPOT VANES

WITH REVERSIBLE FACES

00

Nolon-

ersemact E.

an 17 E.

Deact

)r-)c-

E.

on

g-1-1, 0 11/2" SIZE

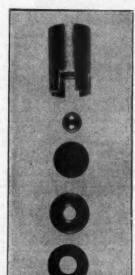
00

SET (4 PCS.) 11/4" SIZE

1" SIZE

SET

(4 PCS.)



"CHEXIT"

CHECK VALVE

FOR

COLDSPOT

WILL NOT LEAK

5 MINUTES TO INSTALL NO FLARING OR CUTTING

250 EACH

ASK YOUR JOBBER

MED. BY

R. ROBINSON REFRIGERATION CO.

425 VAN SICLEN AVE.

B'KLYN 7, N. Y.

WHOLESALERS AND RETAILERS FORMULAS UNDER "FREEZE" CEILINGS

R ESELLERS of products sold at wholesale or retail under "freeze" ceilings have been provided with an alternative pricing method permitting them to pass on increases granted suppliers since March 31.

Following reseller provisions of the Price Control Extension Act of 1946, the present action, effective August 23, 1946, permits these resellers to figure March 31, 1946, percentage mark-ups and to apply these mark-ups to current costs of acquisition.

The present action affects the General Maximum Price Regulation, which "freezes" at March 1942 levels the wholesale and retail prices of thousands of commodities not priced under separate regulations.

The order will not apply to resellers of products on which modifications of freeze prices have been made. Provisions under other orders will be made for resellers excluded from this pricing method.

The present measure is not expected to result in any immediate substantial increases in prices, since provision in separate orders for manufacturers has generally been made thus far for retailers and wholesalers.

CEILING ON USED 1946 DOMESTICS

OPA has adopted a ceiling price on 1946 used domestic mechanical refrigerators.

The maximum cash price, effective August 26, 1946, that may be paid for a used 1946 model, reconditioned and guaranteed for 90 days is 85 per cent of the original retail ceiling of the box when sold now. On "as

is" sales, \$3.50 will be deducted from the

above amount. An addition of \$5 may be made when used 1946 models are sold under a guaranty for one year or more.

222

GETTING DOWN TO BUSINESS (Continued from page 35)

Certainly your own attention to, if not attendance at, the Exposition is a MUST. For, from the developments to be aired at the grand show, you may expect to see and feel the shape of things to come in this progressive industry, things that are related to you as a part of the industry yourself.

Parting Thought: Elbert Hubbard, business man, author, and part-time philosopher passed this earth some years before the birth of mechanical refrigeration, but prior to his passing, he prepared many a tasty phrase. Here's one that makes good food for thought if you are willing to bite into it: "Commerce is no longer exploitation. It is human service, and no business concern can hope to prosper which does not meet a human need and add to human happiness."

x x x

SELLING WINTER SERVICE (Continued from page 36)

primarily at creating winter business, no matter what time of year it is mailed. Of course, summer repair calls aren't turned down, but in the main, response to the mail program and winter service suggestions has been good.

This promotion is carried out entirely separate from standard seasonal promotion; entirely to create winter employment for service mechanics. Similar ideas can be utilized in both the commercial refrigeration and home refrigerator fields.

PRODUCTION SCORE ON CONSUMERS' DURABLE GOODS-JULY

	July	June	Prewar Monthly Rate
Automobiles	220,000	142,000	312,942
Trucks	93,000	59,000	86,840
Passenger Tires	5,100,000	5,200,000	4,200,000
Truck and Bus Tires	1,100,000	1,200,000	1,000,000
Refrigerators	220,000	210,000	809,000
Washing Machines	187,000	194,000	158,000
Radios	1,329,000	1,378,000	1,100,000
Sewing Machines	85,000	27,000	67,000
Vacuum Cleaners	197,000	180,000	156,000
Gas Ranges	127,000	141,000	125,000
Electric Ranges	57,000	46,000	47,000
Electric Irons	502,000	559,000	380,000



PRODUCTS

HELP THE SHOP AND SERVICE MAN

Solve Any Refrigeration Problem Faster



d e is d f. r h s P. ŧ n e

MODEL EJ

A "must" service instrument that starts up defective compressor units without tearing apart the mo-ter assembly. Starts both hermetic and open-type units up to 15 h. p. under actual working conditionsand the Analyzer may be left on the job for emergency service pending later repairs. Has 56 starting combinations.



3-Weigh Holder MODEL 3WA

An all-around shop-use device that correctly indicates refriger-ant charge for both vapor and the charge for both vapor and liquid charging, and eliminates the tank-holding hazard. This valuable time-di-labor-saving unit has aided hundreds of service men to standardize their service techniques.



Thermostat Tester MODEL A100

A precision pecket-size Tester that detects and analyses thermostat de-fects without removing the control from the cabinet. Quickly indicates cut-in and cut-out temperatures and saves blind tempering with the thermo controls. Standard for serv-icing all makes of refrigerators.



See your jobber for information on the complete Airebree line

Weite for descriptive literature

AIRCRAFT SERVICE COMPANY 485 MELWOOD STREET PITTSBURGH 17 PA

New and Improved Appliances

Information contained in this department is furnished by the manufacturer of the article described and is not to be construed as the opinion of the Editor.

Midget Lamp

A MIDGET ultraviolet Sterilamp, half the size of a hen's egg, which will improve the food-keeping qualities of home refrigerators for a nickel a month, has been announced by the Westinghouse Lamp Division, Bloomfield, N. J.

The new lamp, mounted inside the cabinet, simultaneously emits bacteria-killing rays and produces ozone in the air. It is indispensable in high humidity cabinets where spoilage and mold growth



would otherwise soon occur under the higher temperature and humidity conditions maintained to preserve the natural flavor and condition of foods and fruits. In lower humidity cabinets, the type which led in pre-war demand, the main problem has been accumulation of food odors. The ozone produced by the Sterliamp diffuses rapidly throughout the entire cabinet, purifying the food vapors by breaking down the vapor molecules.

The three and one-half watt miniature Sterilamp operates only when the refrigerator compressor runs and on this basis, at least a year's life for the lamp is assured. The transformer required also consumes but three and one-half watts. The cost of the transformer and the new lamp is about half that of the former refrigerator Sterilamp.

Liquid Pump

A NEW positive pressure vane-type pump, VW-1, designed for handling non-lubricating liquids such as water has been announced by the Eastern Engineering Company, New Haven, Conn. Incorporated in the pump

Incorporated in the pump are two composition bearings requiring no lubrication beyond that furnished by the liquid being pumped. The vanes are made of the same material as the bearing.



By means of a special design of the vanes and by applying the proper radii on the vane edges, the vanes are held in contact with the pump ch a m be r. No centrifugal force, consequently, is required to maintain volumetric efficiency.

The pump is specifically designed for use in systems having a relief valve and therefore has no bypass valve built into the pump design. Shaft sealing is accomplished by means of a mechanical rotary

Delivery approximates onehalf gallon per minute. The pump is suitable for operating pressure of from zero to 30 pounds per square inch and is self-priming. The Universal motor is 1/1s

The Universal motor is 1/1s H.P. and is available in either 110 volts or 220 volts. A.C.

Thermometer

A NEW all-metal thermometer known as the Max-Min, which indicates the maximum or minimum temperatures reached, has been introduced by the Weston Electrical Instrument Corporation, Newark, N. J.

Similar in other respects to the standard Weston all-metal thermometer, the new Max-Min, has an auxiliary red index which is manually set by a finger knob which protrudes from the center of the scale glass (as illustrated).



When a record of the lowest temperature reached is desired, this index is placed to the low side of the temperature pointer. The pointer will move the index to the lowest temperature reached during any operating period, and the index will remain at that low point until manually re-set. For a record of the highest temperature reached, the index is simply set at the high side of the pointer.

This new Max-Min carries the same accuracy guarantee as the standard Weston thermometers. It is now available in two models, 221M and 222M, with scale diameters of three and five inches respectively. It is also available in all the usual Weston ranges, and in stem lengths from two and one-half to 48 inches.

It is claimed that this thermometer fills the need for a low-cost device which will provide an accurate record of high or low temperatures, such as on transformers, sterilizers, ovens, chemical equipment, etc., as well as in many processing operations throughout industry.

Defrosting AUTOMATICALLY CONTROLLED



BY PARAGON TIME SWITCHES

Why worry about defrosting? Here's a Switch that provides dependable time control for SHARP FREEZERS in all types of automatic defrosting . . in locker plants, dairies, breweries, packing houses and commercial refrigeration. Regular defrosting increases efficiency and reduces operating costs.

The PARAGON LINE offers service

The PARAGON LINE offers service proved . . . precision . . . quality Time Switches and Timers . . . rugged and durable . . . with a great performance

Paragon can produce Time Controls for any system such as Freon, brine, ammonia, etc., regardless of temperature and whether defrosting is done by hot vapor, electric heat or water spray. Put your defrosting problems up to Paragon engineers.

PARAGON ELECTRIC CO.

1636 TWELFTH STREET TWO RIVERS, WISC.





REFRIGERATION SERVICEMEN

Building good will and increasing your service business is possible by taking Meter-Miser calls

Locating the leak and recharging is one of the services you can render to Meter-Miser owners if you have a supply of—

(Herveen)

the IDEAL REPLACEMENT GAS

Customers and servicemen alike are finding this refrigerant meets their standards of performance when used in Meter-Miser units. When a loss of refrigerant has put the unit out of service, your job becomes a routine call with a supply of HERVEEN for your immediate use.

Send for bulletin on "Procedure for Recharging Meter-Misers with HERVEEN"

For deliveries, see your local jobber or write to

MODERN GAS CO., Inc.

Manufacturers & Refiners 1084 BEDFORD AVE. Brooklyn 5, New York

Caravan Top

N EW on the market is Caravan Top, an all aluminum, heavy duck covered frame that converts the conventional pickup truck into a completely covered, waterproof and weatherproof unit.



Caravan Top is functionally designed along sleek, trim lines to minimize wind drag over top of cab. Zippers on either side of the back make for easy opening; back curtain rolls up and holds up when desired.

Made entirely of high tensile aluminum this unit is easily assembled by one man, mounted on the truck.

and quickly demounted whenever desired. Mounting or demounting takes only a few minutes. So sturdy is its construction that it will support a man's weight.

Caravan Top fits practically any standard make pickup truck built from 1940 to 1946 as

well as the majority built prior to 1940. These are the trucks up to 1½ tons. and mixes below the coll with such small amounts of cooled air as entered the coll chamber by molecular attraction with the original vapor. The mixture emerges into the room at a degree of both sensible and latent heat most

conducive to comfort.

Explained technically: in a typical summer condition of 80°F. and relative humidity of 50% has a water-vapor pressure of .517 in. mercury and a moisture content of 5% grains per cubic foot. If a temperature of 32°F. is maintained in the coil enclosure, the corresponding water-vapor pressure will be .180 in. mercury; and if the enclosure has a volume of one cubic foot of air, it can hold a maximum of 2.1 grains of moisture. Since vapor pressures will equalize themselves, the high-pressure moisture vapor at .517 will flow into the coil enclosure having a low pressure of .180 in. of mercury. This flow will continue as long as the vapor pressure difference prevails.

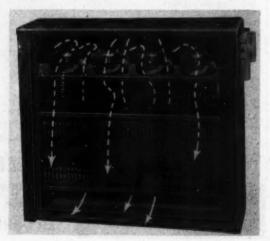
An incidental economy feature of the new unit is the use of a smaller condensing unit using less horsepower, since, with the principle employed, it is not necessary to lower air to the dew point to effect the removal of mois-

Named the Amcoil Comfortaire Conditioner, the unit is now available in two floor models designed for homes, shops, laboratories, dratting rooms, and other applications.

Air Conditioner

TAKING their cue from the fact that "it ain't the heat but the humidity" that creates discomfort, engineers of the American Colls Company, Newark, N. J., have devel-oped a radically new type of air-conditioning unit that has been granted what is known as a basic patent (Patent No. 2,405,812). It is the first important improvement in removing moisture from the air in many years. In more scientific terms, bodily dis-comfort results from two kinds of heat, sensible and latent. The former concerns mere temperature and is the kind of heat combatted by air-conditioning systems that merely lower temperature. Latent heat involves relative humidity and the new unit, coping primarily with latent heat, removes moisture from the air without over cooling. The result is de-humidified air in which the normal evaporation of moisture from the body-nature's provision for cooling-can take place without reducing the temperature of the air to a point condu-cive to shock when street temperatures are suddenly encountered by one entering or leaving the conditioned area. Self-adjusting, this new unit permits more cooling on hot, dry days, and more re-moval of moisture on cool, humid days.

The operating principle of the American Coils innovation is the simple law of physics that vapor pressures equalize themselves. A coolcreates a low vapor pressure area. Air with moisture in the form of vapor, entering the unit is attracted to this low-pressure area through small openings in the coil enclosure. There it condenses and is drained off. Air thus relieved of its moisture content flows past the enclosed without contacting it,





of

il ic. T.

to

st

ir n dor a e, Bn. re

8-28 10 or 11 8-

as e

ie g

n-

0 8-

18

s,

The Kramer Radial Cooling Unit is suspended from the ceiling where it does not interfere with usable space. Cool air, discharged radially from around the complete circumference of this unit, mixes with the warm air at the ceiling of the refrigerator as it spreads and descends resulting in a minimum of temperature and humidity variation of the box.

Out of the way location

Accurate ratings and easily used Rapid Selection Tables assure adequate refrigeration and high humidities.





 Aerovox listings are thoroughly cross-indexed, include both exact-duplicate and universal re-placements, and are kept right up-to-date. At a glance you can pick the right type for any Ask your jobber for Aerovax motor-starting capacitors and that helpful data.



AEROVOX CORP., NEW BEUFURD, MASS., U S. A. Export: 13 E.40th St., NewYork 16, N.Y. . Cable: 'ARLAB' In Canada: AEROVOX CANADA LTD., Hamilton, Ont.

THERMAL CO. EXPANDS

XPANDING operations. have necessitated an enlargement in their official staff and the Thermal Company, Inc., announces the following changes.

E. F. King become's Executive Vice President and retains his former office of Secretary.



H. F. Wallace E. F. KING becomes Vice President in charge of merchandising activities which include both the sales and procurement departments.

H. J. Steege becomes Treasurer.





H. F. WALLACE

Thermal Company, Inc., are wholesale distributors of equipment supplies, controls and parts. They are located in St. Paul, Minn.

CALIFORNIA WHOLESALER **ENLARGES STORE**

THE California Refrigerator Co., 1077 Mission St., San Francisco, 3, recently enlarged their Oakland branch located at 441

23rd St. Opened in the Fall of 1939 it was the first wholesale refrigeration supply house in the East Bay area. Due to the steady increase in business during the past several years, the company purchased the building in which they formerly occupied one-third of



CARL WILLHOFT

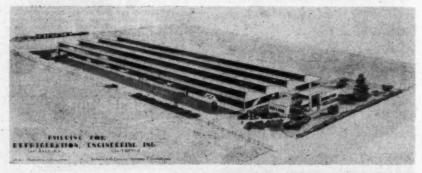
the available space. The remodeled store occupies the entire building, with floor space of approximately 6750 sq. ft.

Carl Willhoft is manager of the Oakland store.

S S S "RECOLD" BUILDS NEW PLANT

REFRIGERATION ENGINEERING, Inc., of Los Angeles, Calif., will shortly add another milestone in the record of their company. This particular step will be taken when the company moves into a three-acre factory which occupies the center of a thirteen and one-half acre tract in the industrial section of Los Angeles County in Southern California. This move is the culmination of a fourteen-year growth of the company whose products are known under the trade name of "Recold."

In 1932 Hy Jarvis and Walter F. Hancock



The architect's portrayal of the new plant now being erected by Refrigeration Engineering, Inc. of Los Angeles, Cal. Covering three acres of a thirteen and one-half acre tract, the new plant which will be completed early this fall will provide facilities for approximately 500 production workers.

HIGH SPEE

LOW COST





077 tly 441

re or

nd

G, ly eir en re a

nin 11he er ek

WATER and LIQUID COOLING ... with the HEAT-X CAST ALUMINUM COOLERS

HEAT-X Coolers are supplied in various capacities so that your precise requirements will be fulfilled.

HEAT-X Features: No freeze-up damage . . . More BTU's per watt . . . No short cycling . . . Small refrigerant charge . . . Assured sanitation . . . Operates in any position., . . Small space required . . . Low initial cost . . . Long life.

See Our Display at the Cleveland Show Booth 426

The Industry has waited and hoped for a lowside product such as we offer combining top performance and little cost. It is an instantaneous cooler, but with block holdover sufficient to prevent short cycling and to maintain uniform outlet water and liquid temperatures with intermittent flow.

Write at once for Neat-X Engineering Specifications and Capacity Tables

Orders Promptly Shipped

THE HEAT-X-CHANGER CO., INC. 415 Lexington Avenue, New York 17, N. Y. Brewster, N. Y.

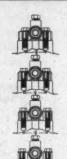
Another SUPERIOR FIRST



7ke "UNI-HOLE" Flanged **Compressor Valve**

Has Universal bolt holes for use with 5/16" bolts or cap screws, to facilitate installation on compressor flanges having 1-3/8", 1-1/2", 1-5/8", or 1-3/4" centers.

Simply install the "Uni-Hole" Valve in its proper position add the two heavy weathers (supplied with each valve) between the flange and bolt, or cap screw head . then tighten. That's all there is to its property that the stription of the strength of the stription of the strength o



BOOTH 131 - ALL-INDUSTRY SHOW

VALVE & FITTINGS COMPANY PITTSBURGH 26. PENNSYLVANIA



POSITIVE FLEXIBILITY

A diaphragm acting synthetic rubber ring.

No sliding fit between a rubber part and shaft or sleeve.



HIGH GRADE MATERIALS

High grade steel and bronze of known wearing quality are used for the seal faces.

Arlington
SHAFT SEAL

MODERN DESIGN PRODUCTS CO.

merged their meagre resources to organize Refrigeration Engineering, Inc. At the beginning of their business career their efforts were devoted entirely to the production of one type of cross-fin coil. Today they are turning out more than sixteen kinds of coils in one hundred and forty-five models. They are the patent holders of the water defrost coil used in low temperature installations such as frozen food walk-in boxes, locker plants, and ice cream storage and holding rooms. At the present time, in addition to the parent company there are eight other firms in the United States who are building the water defrost coils under a license agreement with the corporation.

During the fourteen years of operation there is but one year during the first months of war production, which does not show a sizeable increase in sales volume.

During the intervening years "Recold" can point with pride to several accomplishments. Less than one year after the founding of the company they began to manufacture apartment house blower coils in multiple units. This type of installation used a single compressor for each job, yet provided a separated coil for each apartment kitchen.

In 1984 they introduced the first type of blower coil to be manufactured in the West and for a period of three years, they were the only firm in the West manufacturing this type of equipment. They have also pioneered the development of blower coils in the United States. While their first products along this line were somewhat crude, they nevertheless did a remarkable job and in 1936 "Recold" offered a perfected line of blower coils to meet the ever changing needs of the refrigeration industry. It was in 1938 they introduced the "Recold" water defrost unit and in 1940 a patent covering this product was issued.

The new plant which will be formally dedicated early this fall will provide greatly expanded manufacturing facilities and will accommodate from 450 to 500 production workers. The present payroll includes 150 people and this number will be continually increased as materials for greater production becomes more generally available.

S S S

KELVINATOR, EASTERN SALES MANAGER DIES

STEELE R. SELLERS, eastern sales manager, Kelvinator Division of Nash-Kelvinator Corporation, died suddenly of a NOW ...

PIPE JOINT COMPOUND

in Stick Form

FOR ALL THOSE PIPE INSTALLATION AND REPAIR JOBS—Always Ready for Instant Use



ECONOMICAL - HANDY - CLEAN

Note these FEATURES

NO MESS - NO BRUSH NO WASTE

Withstands Freon, methyl chloride, butane, propane and other refrigerants, ell, air, water, brine, etc.

Lubricates and completely seals pipe joint threads, nuts, boits, gaskets, turnbuckles, etc.

Centains no lead. Contains no injurious ingredients.

ASK YOUR DEALER—OR WRITE US

COPR. 1946 Lake Chemical Co. 626 N. WESTERN AVE., CHICAGO 12, ILL.



We'll be seeing you

this year at the R.S.E.S. Convention as well as at the Fourth All-Industry Exposition in Cleveland, As usual, U.E.I. will publish the

> EXPOSITION REVIEW

> > during the show.



on Shudy Resident Training Engineering Institute

REFRIGERATION AIR CONDITIONING

Send for FREE FACTS Today!

Training Men Continuously Since 1927

heart attack August 8 at his home in Birm-

ingham, Michigan.

Mr. Sellers was born in Pittsburgh, May 29, 1898, and was graduated from Penn State in 1914. A veteran of World War I, he was associated with the Western Pennsylvania Power Company and with Western Electric before joining Nash-Kelvinator. Prior to World War II he was sales manager of Kelvinator electric ranges and during the war was appointed assistant to the vice-president for war production.

x x x

RUTHENBERG, INDIANA CED CHAIRMAN

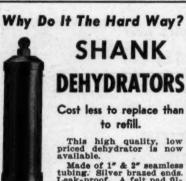
OUIS RUTHENBURG, President of L Servel, Inc., of Evansville, has been appointed Indiana State Chairman of the Committee for Economic Development, it was announced by Walter Fuller, president of the Curtis Publishing Co., and chairman of the newly formed CED National Information Committee.

Among wide business and professional connections, Mr. Ruthenburg is a member of the Board of Directors fo the Federal Reserve Bank of the Eighth District, a

member of the Labor-Management Advisory Committee to the Secretary of Labor, and director and past president of the Indiana State Chamber of Commerce. Mr. Ruthenburg undertakes his new duties with a solid background of leadership in CED's wartime program of planning for increased production and employment beyond recon-

"Since the termination of activities by its Field Development Committee earlier this year, CED has engaged in an intensified program of responsible research designed to encourage national economic policies which will lead to the maintenance of high levels of production, distribution and employment in this country," Mr. Ruthenburg said.

"It will be my objective to enlist the interest of Indiana businessmen and others who wish to associate themselves in a common effort to create better understanding of the facts and principles underlying the nation's economic problems. Only through better public understanding will come the new policies which will enable us to avoid the boom and bust cycles which have plagued the nation for so many years," he added.



Made of 1" & 2" seamless tubing. Silver brazed ends. Leak-proof. A felt pad filter of sufficient size and texture insures a clean flow of refrigerant. Furnished dry sealed. Filled with either Calcium Chloride, Activated Aluminia or Silica Gel.

OTHER SHANK PRODUCTS Semi-Steel Valves-All-Steel Line Valves Water Regulators-All-Steel Gauge Sets Write for prices

CYRUS SHANK CO. 25 Jackson Blvd. Chicago 6, III.



STOP



TERMINAL LEAKS COMPLETE KIT

(3 Terminels)

\$550

PAT. PENDING

ory

ina en-

arsed

on-

by

ier

si-

le-

di-

of

nd

he

240

m-

ng

he

gh

he

id

Lower Prices

Please Mention Jobber's Name

Coldspot Couplings
and Dome Gaskets.
Immediate Delivery.
25 cents each in lots of 10

WAGNER REPLACEMENT TERMINALS

A research development designed to repair terminal leaks on sealed units, instantly and permanently on the job—

IN 5 MINUTES

No special tools or equipment required. Now available for Crosley F 12. Soon available for Frigidaire, Westinghouse, Norge, Kelvinator, and TECUMSEH (Chieftain) UNITS.

Territories Open to Manufacturers Representatives

KINGS COUNTY	REFRIGERATION CO.
1257 Elethent A.	Brankler 26 N V

1257 Flatbush Ave., Brooklyn 26, N. Y.

Address

We Will Ship Prepaid

No. of Complete Kits..... No. of Couplings.....

No. of Dome Gaskets.....

C.O.D.
Pre-Paid

ARE YOU Equipping a new Serviceman

Equipping a new Truck

Going back into Service Work

We have prepared a very helpful list of items suggested as a minimum stock. Several lists are available. Check the ones you want.

- Service Teels
- ☐ Parts for Domestic Service
- ☐ Parts for Commercial Service

Use your letterhead and send your inquiry to Dept. A.

T H E R COMPANY

> A L INC.

St. Paul, 4, Minn. 2410 University Ave. Milwaukee, 3, Wise. 749 Ne. Seventh St. Dea Meines, 9, Iowa 106 Eleventh St. Cedar Rapids, Iowa 563 Fourth Ave. S.E. Great Falls, Ment. 368 First Ave. Seuth



Each ring is made up of two IDENTICAL interlocking parts that fit together to form a ring without a gap . . . eliminating blow bys. Holds high Diesel compression that means smooth, full flow of power. Tension . . flatness . . circularity . . and close dimensional limits assure perfect seal. Sizes from 1" to 36" . . . for original equipment or replacement in Diesel units, and for pneumatic and hydraulic equipment. Used also for oil rings . . contracting rings for sealing shafts, bearings, etc. We also make conventional-type rings.



Write for Information
THE AUTO-DIESEL PISTON RING CO.
3157 Superior Ave. CLEVELAND 14, OHIO

QUALITY RINGS SINCE 1921

BABY "BUD" McKEE ARRIVES

MR. AND MRS. "BUD" McKEE of Detroit Lubricator Co., are the proud parents of a baby boy born August 28, 1946.

PENN OPENS NEW FACTORY

NEW factory building at 1351 Roosevelt Ave., Indianapolis, Ind., has been leased by Penn Electric Switch Co. of Goshen, Ind. This latest acquisition boosts the company's total to three factories. The second factory was put into operation on January 1 in Toronto, Canada.

According to Albert Penn, president, the additional manufacturing space is but another step in the company's expansion program designed to give faster deliveries and more efficient service to its customers. Production in the new plant is expected to start

shortly after October 1.

The Indianapolis plant will fabricate and assemble some of Penn's present line of controls as well as new products recently developed. The company manufactures automatic controls for heating, refrigeration, air conditioning, pump and air compressor applications as well as safety controls for internal combustion engines.

GUS LARSON—BUILDER

BUILDING a house is easy when you've got a dosen friends to help, and Willard Krueger, 80, of Milwaukee received the surprise of his life when the "gang," led by his boss, Gustave A. Larson, arrived at the site of his new home and started erecting it for him.

Krueger, who was discharged from the navy last March, received his house in sections, and went out to analyze the assembling problem.

The "gang" was already there. The men had heard that Krueger was getting a sectional house, and Larson said he "got to thinking" about helping in the erection. "I talked with a couple of the boys and they all said, 'Sure, we'll be glad to help.' "

The first piece of flooring was laid in a twinkling, but then it was discovered that, due to a blueprint error, a bracing beam had been incorrectly placed when the basement was constructed. Krueger's father, George, a mason contractor, was on hand to direct its replacement, and the "gang" chipped concrete, moved the beam, and finished laying the flooring before the mosquitoes got too thick at 8:15 p. m.

REMOTE WATER COOLERS

NORMAL SUCTION PRESSURE

For drinking water bubbler service, glass

filler service, photographic developing, etc. Compact for floor, wall or ceiling installation. Capacities 6 to 25 gallons.

Also available nowcafeteria glass filler coolers, self-contained type bubbler coolers for offices. stores or factories. Write for latest data.



REPAIR AND SERVICE REFRIGERATORS

. WIRING, COPPER TUBING, ELECTRODES, ETC.

with

u've Vil-

ved

ved

the

as-

en

ec-

to "I

ey

a

at,

e-

er,

nd

IDEAL "THERMO GRIP"

More and more refrigerator service men are turning to "Thermo-Grips" for all of their soldering work, because "Thermo-Grips" are so easy to use and do a better job – faster!

"Thermo-Grips" are more than just ordinary soldering irons—they are handy electrical soldering tools designed to handle hard and soft soldering—sweating and unsweating threadless copper pipe and fittings, soldering terminals, lugs, etc.

Safe—no pre-heating or open flame hazard. The part touched heats almost instantly. Heat



is concentrated on the spot to be soldered—no danger to nearby parts, walls or partitions.

Ask your Jobber about a demonstration—today!

d. Destributed Through

AMERICA'S LEADING WHOLESALERS

(IDEAL)

PROMPT DELIVERY

1939

IDEAL INDUSTRIES, Inc.

Commencer Brassler Co.)



LEAKS?

Find them with VISOLEAK

VISOLEAK detects even the smallest leaks before they cause damage to expensive refrigeration systems. Years of use prove it safe, economical, easy to use.

NEW CHARGING SET

The VISOLEAK Charging Set was developed to inject VISOLEAK, add refrigerant oil, or recharge sealed units. For use on all types of refrigeration systems without danger of introducing air or foreign matter.

Charging Set—complete with hoses. \$7.50 Filler enly—without hoses..... 6.00

WHOLESALE

CASE LOTS

4	ounce bottle. \$	1.00	48	bottles
8	ounce bottle.	1.75	24	bottles
1	pint bottle	3.00	24	bottles
1	quart bottle.	5.00	12	bottles
1	gallon can.	16.00	6	CADS

SAVE 10% ON CASE LOTS

See your refrigeration supply jobber or write for complete information.

WESTERN THERMAL EQUIPMENT COMPANY

1781 West Shanes Avenue

Los Angeles 46, Calif.

REFRIGERATION SUPPLIES

Setsulcameus—Put us to work for you when you need parts and supplies. Most items are now in stock ready for delivery or shipment.

You can DEPEND on BLYTHE

An inquiry or order on your letterhead will be promptly and efficiently handled.

H. W. BLYTHE COMPANY 2334 S. Michigan Ave. CHICAGO 16, ILL.

BURL BOYKIN, JR. DIES

BURL BOYKIN, JR., passed away suddenly of heart failure in New Orleans, La., August 24.

He leaves his wife, Elizabeth Hayes Boykin, and two children. Mr. Boykin received his education at St. Edward's University and Oklahoma University, graduating in 1930. Degree, Mechanical Engineering. Mr. Boykin joined the Standard Brass & Mfg. Co., Port Arthur, Texas, in 1937, and at the time of his death was a Vice-President and Manager of the Beaumont, Texas, branch warehouse of the company.

x x x

NEW WHOLESALER IN ROCHESTER

CENESEE Refrigeration Supplies, Inc., is a newly formed wholesaler located at 31 Spring St., Rochester, N. Y., and covering 16 adjoining counties. It is owned and operated by Arthur W. Snyder and Henry J. Dyminski.

Mr. Dyminski was a captain in the Air Force and served 4½ years in the service. Previous to his service with Uncle Sam he had five years' experience in refrigeration service.

Mr. Snyder has been in the refrigeration business 17 years, spending most of that time with distributors, managing service departments, shooting trouble, and finally managing a branch store and selling commercial refrigeration.

Both are well acquainted with the trade in the area.

222

LOS ANGELES CONTRACTORS APPOINTS NEW SECRETARYMANAGER

FOLLOWING the resignation of its Secretary-Manager L. K. (Larry) Brink, who is associating with the Jennings Refrigeration Company as general manager, the Association Board of Directors has announced the selection of N. S. (Neal) Templin, as Secretary-Manager. Mr. Templin is well known to the Refrigeration Industry in Southern California, having been with the York Corporation for 24 years in various capacities and as Asst. Manager of the York Los Angeles Factory Branch. He has been an active member of the Refrigeration Contractors Association, having served on its Board of Directors for two years and also on various Association Committees, such



IT'S THE TRAINING THAT COUNTS!

udins, oy-

ved lty, and 30. oy-Co., me

anre-

ed nd ed nd ir ce. he on

t-

al

le

n

f

e

Practical Shop Training

1-

AIR CONDITIONING
DOMESTIC—COMMERCIAL
INDUSTRIAL REFRIGERATION

Service, Maintenance and Installation

COMMERCIAL TRADES INSTITUTE

200 South 20th Street
Department A
Birmingham, Alabama

Veterans Inquire About G. I. Training Train in Birmingham, "The Magic City"

REFRIGERATION



SERVICE MANUAL.
Covers all domestic and commercial systems.
Construction, operation, installation, adjustment, testing, trouble shooting, replacement, repair, etc. Also refrigeration applied to air conditioning. 300 pages, fully il-

lustrated, understandably written.
Only \$2.25 postpaid (if C.O.D. plus postage fee). Money back guarantee.

We specialize in all books on Refrigeration, Air Conditioning, Heating, Ventilating, Plumbing, etc.

Join our new TECHNICAL BOOK CLUB—free. Members receive current literature, guidance on all book problems, premiums. No obligation. All technical books. Write for FREE literature, specify subjects.

MODERN TECHNICAL BOOK 65, Dept. R.S., 35 West 42nd St., New York 16, N. Y.																													
Please se																													
ICE MAN money postage).																													
NAME								*	*						×	a.					*	*					*		
ADDRESS												*	*	*	×			. ,											
CITY													1	20	32	NI	E.			1	ď	P/	A.	r	E				,

as Government Regulations, Labor Relations, Training Program and Compensation Insurance committees.

TRI-CORE BULLETIN

NEW color bulletin describing a unique solder product, Tri-Core, recently developed by Alpha Metals, Inc., has been issued by that company.

The folder describes Tri-Core as a selffluxing solder, with three cores located just beneath the outer surface of the wire. This new 8-core design assures a continuity of flux flow, as empty flux sections are pre-Production slowdowns are thus cluded. prevented.

Since Tri-Core permits use of lower tin content solders, the solder cost per pound to the user is less.

Copies of the bulletin, which give detailed information about Tri-Core, may be obtained from Alpha Metals, Inc.

. x x x WOLVERINE BULLETIN

NONDENSER TUBES" is the title of a new brochure just off the press prepared by Wolverine Tube Division of the Calumet & Hecla Consolidated Copper Co., Detroit. Included are several tables designed to help users of condenser tubes select most efficient materials for their operating equipment. It tells about the numerous copper, brass, and copper base alloys and their chemical and physical characteristics as applied to condenser and heat exchange use. It shows a very comprehensive graph giving safe working pressures and has two pages devoted to estimating data covering tube sizes from %" to 2" O. D. Several pages are devoted to Wolverine Trufin, the integral finned tube. A copy will be sent upon request.

x x x KRAMER BULLETIN

KRAMER TRENTON COMPANY, Trenton 5, New Jersey, have just released a new bulletin No. 16 entitled "Thermobank."

This book gives a comprehensive coverage on low temperature refrigeration applications. The information contained will be generally useful to the application engineer in the freezing temperature field. The rapid selection tables are a time saver in the selection of low side and high side equipment for freezer jobs most commonly encountered.

FOR SALE-10,000 NEW ALUMINUM ICE CUBE TRAYS IN 3 POPULAR SIZES



air-cooled and watercooled remanufactured condensing units in sizes from 1/4 to 2 H.P.



Write for Particulars

EDISON COOLING CORP.

310 E. 149th St. New York 51, N. Y.





The TEMPSCRIBE Recorder is outstanding for its universality. Any TEMPSCRIBE can be quickly converted from temperature recording to time-operation recording simply by changing the door of the instrument. A widely-used combination comprises one clock case (having a 24-hour spring-wound movement) and two doors (one with a bi-metallic temperature element, and one with mechanism for recording motor on-and-off time).

This economical set costs very much less than a dual recorder. Even two complete TEMPSCRIBES, to obtain simultaneous records of temperature and motor operation, cost no more than you would normally expect to pay for a single instrument that makes dual records, yet give you all the advantages of two separate instruments!

Bulletin 704 gives list of ranges, practical application data, and complete details,

Ask Your Whalesaler, or Orders Filled Direct.

BACHARACH Industrial Instrument Co.

7000 BENNETT STREET . PITTSBURGH & PA.

MEET US AT BOOTH 108



s dees se-

their t the base

ysical

and

npre-

sures

ating to 2"

lver-

copy

NY,

t re-

itled

rage

lical be

neer apid the

nent

ered.

ι

ue

out-

Any

ding

nply

tru-

ring weih a ent,

reie).

ne-

an-

ion

O.

N

You'll be interested in seeing B. S. & B. SAFETY HEAD Pressure Relief Devices under actual operating conditions at the All-Industry Refrigeration and Air Conditioning Exposition to be held October 29th to November 1st in the Cleveland Public Auditorium. Look for us in Booth 108.

B. S. & B. SAFETY HEADS

The "Midget" and "Baby" shown here are made specifically for refrigeration and air conditioning systems, as well as hot water tanks and small air tanks.

WRITE FOR CATALOG.



BARY"

BLACK, SIVALLS & BRYSON, INC.

SALES OFFICES: 24th Floor Power & Light Bldg., Kansas City 6, Mo. PLANT: 7500 East 12th Street, Kansas City 3, Missouri

To Locate or Sell

Used Equipment

USE a classified ad

Quick Results . Low Cost

"SEAMLESS" REFRIGERANT CYLINDERS

SO₂ Capacities 5 Lbs. 10 Lbs. 25 Lbs. 35 Lbs. ICC SPECIFICATION 3B300

SEAMLESS STEEL BODY
HEAVY DUTY SERVICE VALVE

FINE PRODUCTS CO.
711 West Lake St. Chicago 6, III.

REFRIGERATION UNITS, PARTS & SUPPLIES

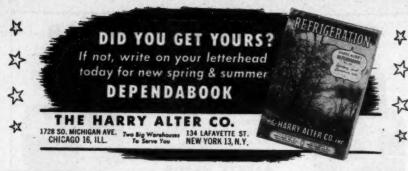
AIR CONDITIONING EQUIPMENT

Delco and Wagner—Electric Motor Parts 26,000 Square Feet of Shop and Warehouse Space Same Day Service—On Items in Stock

HERMETIC UNITS AND COMPRESSORS REPAIRED

SERVICE PARTS COMPANY

2511 Loke Street, Melrose Park, Illinois
"FOR SERVICE AND PARTS—WRITE TO SERVICE PARTS"



Service Men:

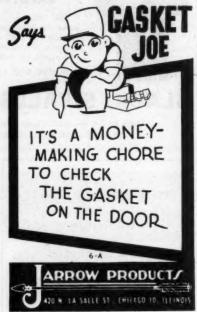
We will try to maintain a 10day service to you on all valves sent in for REPAIR.

We have a few Detroit Thermostatic and Automatic Expansion Valves ready for immediate exchange. Our price on the Thermostatic Valves for either Repair or exchange is \$3.00.

For the Automatic \$1.75

Send us your valves. Our work is guaranteed.

CIRCLE VALVE REPAIR
327 So. La Salle St.
Room 348 Chicago 4, Illinois





THIS IS IT! YOUR CATALOG ...

WRITE FOR YOUR COPY NOW

Reserved for the wholesale trade enty. Business identification is required before your copy will be mailed.

This plastic bound catalog is designed for your use. Items of the same type are grouped together for convenient ordering. Here is the latest in new items added to our already large stock of tools, parts & supplies.

Automatic

HEATING & COOLING SUPPLY
(Division of Well-McLain Company)

647 W. Lake St. 809 W. 74th St. CHICAGO 6, ILLINOIS

COMPRESSOR REPLACEMENT SERVICE

Immediate delivery on a replacement schedule for over 125 compressors. Shipment of a replacement compressor can be made the same day yours is received. Most standard models available for this service. 90 day guarantee—Reasonable prices.

We do not repair hermetic units.

For quotations, 'phone ALBany 1703 or Write

KEYSTONE ENGINEERING CORP.

4140 CHICAGO AVE.

CHICAGO 51, ILL.



10 DAY SERVICE

Factory Rebuilt Units \$3995 (ALL MODELS EXCEPT "C")

- Genuine Grunow Parts.
- Guaranteed 6 months.
- Just unfasten bolts holding board and ship complete.

AUTHORIZED SERVICE, INC.

18 YEARS ON MARKET



Registered U.S.A.-Canada

Factory: 1635-39 Platte St.

SOLDERING COMPOUND

PENETRATES BUST, PAINT AND GREASE, TINS STAINLESS STEEL, GALVANIZED AND BLACK IRON. CLEANS AND TINS BY SIMPLY APPLYING HEAT.

Sold Through Automotive, Refrigeration Service, Etc. Jobbers. Used by Army and Navy.

TINIT MFG. CO. BOX 794, DENVER 1, COLO.

TO SOLDER-TIN-IT FIRST

NEW! NEW!

HOW TO MAKE REALLY TIGHT FLARE JOINTS SEND FOR YOUR COPY OF "FLAREKOPS" GET THE REAL INFORMATION GOODBY TO LEAKS

FLOW CONTROLS, INC.

1821 W. North Avenue

Chicago 22, Illinois

SAVE YOUR TIME BUY BY MAIL

Casper, Wyoming, dealer writes:

"We are very much pleased with the Alert, Efficient and Courteous way in which Airo handles our orders. Our only regret is that there are not more of your kind of businessmen left to do a normal business with again."

Air Conditioning and Refrigeration Parts - Tools - Supplies Shop Equipment

Request Catalog on Your Letterhead

AIRO SUPPLY CO., INC.

Dept. A, 2732 N. Ashland Ave. Chicago 14, III.

Controls Repaired & Rebuilt

Just Mail in Controls—We Handle the Rest
COMMERCIAL — DOMESTIC —
INDUSTRIAL

Come Year Guarantee
Each Control Reset and Cycle Tested

Domestic Cold Controls (Modern Type) \$2.06
Commercial Controls (Pres. or Temp.) 2.26
Commercial Dual Controls . 3.00
Automatic Water Valves . 2.00
Automatic Expansion Valves . 1.75
Thermostatic Expansion Valves . 3.00
All Prices F.O.S. Chicage and subject to
change without notice

change without notice

ACME CONTROL SERVICE

SS25 Lawrence Avenue—Chicago 30, Illinois
Phone PENascola 3303

WHY GUESS?

CHECK YOUR VALVE SETTINGS

Acme Attachments Are Fast— Accurate—Dependable



See or Write
Williams & Co. Inc.
Cleveland

Macklanburg Supply Co., Oklahoma City

The Electrometive Corp., Dallas



Wilson ZEROSAFE

Wilson ZEROSAFE Is Years Ahead

SINCE 1939 Enthusiastic public acceptance and constant daily use have proved Wilson ZEROSAFE the greatest Reach-in Farm Freezer in America. These years of trouble-free ZEROSAFE service are your guarantee that the new ZEROSAFE, now greater than ever before, will continue to revolutionize American eating habits by making frozen fresh foods a part of daily living.

There is a ZEROSAFE size for EVERY need. Self-Contained Models are of 15 and 25 cu. ft. capacities; Sectional Models, from 22 cu. ft. to 120 cu. ft. Model illustrated is FF-44.

For franchise information address Desk 15

WILSON REFRIGERATION, INC.
SMYRNA DELAWARE



indicates an installation that can be serviced efficiently. Accessibility is a keynote of Servel design. Call up your local Servel distributor or authorized parts jobber.

Electric Refrigeration Division SERVEL, Inc. Evansville 20, Indiana

REPAIR SERVICE

Cold Controls • Pressure Switches **Expansion Valves**

Look and Work Like New Controls Original Factory Specifications

UTILITY THERMOSTAT CO. 4011 Halidale Ave Los Angeles 37, Calif.

WE HAVE

SERVED

ad and

son ica. our Teve

bits

ned

els,

RE ON



LET US SERVE YOU

VALVES REBUILT

APPEARANCE AND OPERATION LIKE NEW FACTORY ADJUSTMENT

Automatic Expansion Valves\$1.75
Thermostatic Expansion Valves 3.00
Automatic Water Valves 2.50
90 Day Guarantee. Prices F.O.B. Chicago.
A.ARCO REFRIGERATION SERVICE

4110 N. Pulaski Rd. Chicage 41, III. Owned and Operated by Veterans

REFRIGERATION

Service Men

Get acquainted with our methods of doing business in preparation for the increased business you will do this year.

Service men all over Canada find our stock of well known products an added advantage in making sales and building good will among their customers.

Airco gives courteous, prompt service on your orders. Build up your stock of popular items now in preparation for the season's business.



CANADA

ONTROLS • VALVES Repaired or Exchanged

We completely disassemble controls, clean, test, check and replace defective or broken parts, and set for proper temperatures.

Domestic Cold Controls (Modern) Commercial Controls (Pres. or Temp.)... Automatic Expansion Valves..... Thermostatic Expansion Valves.... Automatic Water Valves...

90 day guarantee Prices F.O.B. Chicago

REFRIGERATION CONTROL SERVICE

4840 S. Springfield Ave.

Chicago 32, III.



TRAIN WHERE THE

Learn Domestic and Commercial Refrigeration and Air Conditioning Maintenance & Service.

Full or part time Residence course or Combination Home Study & Shop training.

VETERANS-Commercial Trades Institute for GI training

Write for free Descriptive booklet

COMMERCIAL TRADES INSTITUTE

1400 Greenleaf Ave. CHICAGO 26, ILLINOIS

OUR NEW CATALOG!



Send for your copy of this Big, New Catalog of Refrigeration and Air Conditioning supplies. Just off the press! Reserved exclusively for the Wholesele Trade. Include proper identification with your request.

CHAJE
REFRIGERATION SUPPLY CO.
546 W. 119th St. * Chicago 25, III.

CONTROL REPAIR

Power elements and domestic controls reconditioned equal to new at a small cost. All work guaranteed for one year. Prices upon request.

United Speedometer Repair Co. 342 W. 70th Street New York City 23

In the West It's REFRIGERATION SERVICE INC.

Pacific Coast Supply Jobber Since 1928

Your letterhead will bring our latest catalog—also our House Organ,

"The Liquid Line"



3109 Beverly Blvd. LOS ANGELES 4. CALIF.

STANGARD TO Surface COLD PLATES For Maximum Refrigerating Efficiency

THE STANGARD DICKERSON CORP.

46-76 Oliver Street . Newark 5. N.J.

COMPLETE STOCKS

TRY US FOR-

Thermo Valves .
Dehydrators
Copper Sweat Fittings
Brass Flared Fittings
Dayton Belts

Ammonia Valves Bundy Steel Tubing Copper Tubing All Refrigerants Water Valves

Tools—Gauges Refrigerant Cylinders Weiding Fittings Hermetic Kits Refrigerant Olls, etc.

Send for our catalog

FRED C. KRAMER COMPANY

212 N. Jefferson St.

CHICAGO 6, ILLINOIS

Tel. Randelph 6288

READY NOW

Our 1946 Catalog of refrigeration supplies and parts For Immediate Delivery on All Items Write for your copy today. G. & E. EQUIPMENT SUPPLY CO. 400 N. Sangamen St.

Chicago 22

Illinois

COLD CONTROLS & EXPANSION VALVES

repaired or exchanged

at the following prices, F.O.B. Chicago

Automatic Expension Valves (All Makes) \$ \$4.75
Thermostatic Expension Valves . 3.00
Automatic Expension Valves . 3.00
Demestic Cold Controls (Modern Type) . 3.00
Commercial Controls (Temp. or Pressure) 2.75
Commercial Dual Controls . 3.50

ALL WORK GUARANTEED FOR 90 DAYS

NEW DUTY

2424 Irving Park Blvd, CHICAGO 18 ILL.

JUST OUT!

4 Books in One!



Covering: Basic Principles, Servicing, Opera-tion, Repair of Household

Commercial Industrial Refrigeration
Air Conditioning
Systems

A gold mine of essen-tial important facts for ENGINEERS, USERS AND SERVICEMEN. Here you have at your fingers' eads a Complete Library in ONE VOLUME, the necessary in ONE VOLUME, and the nece

COMPLETE . PAY ONLY \$1 A MONTH Out This information for Yearned, ASS Cream Tester to bigaries trained and the County of the County

iame	 	 	 	 	
leidre	 	 	 	 	

GASKETS



Write for complete catalog.

specify CHICAGO. WILCOX gaskets for every refrigeration nood. Our complete gasket service provides a of supply to meet your -requirements. Get full details today.

CHICAGO-WILCOX MFG. CO. Chicago 19, Illinois

COLDSPOT REPAIR SERVICE

COMPLETE UNIT OR COMPRESSOR OPEN TYPE ONLY

Work Guaranteed

Write for Price SUPREME MFG. COMPANY

3006 N. Franklin Ave. FLINT 6, MICHIGAN

Index to Advertisers

A-Abco Refrigeration Service 109 Ace Ice Cream Cabinet Co. 107 Acme Control Service. 108 Acmous Products Co. 108 Acrowox Corp. 93 Airco Refrigeration Parts 109 Aircraft Service Co. 89 Airo Supply Co. 108	Kelvinator (Div. of Nash-Kelvinator Corp.) Kerotest Manufacturing Co. Keystone Engineering Corp. 10 Kinetic Chemicals, Inc. Kings County Refrigeration Co. Kold-Hold Manufacturing Co. Kramer Co., Fred C. 1 Kramer Tention Co.
Alco Valve Co. 19 Alter Co., The Harry 106 Ansul Chemical Co. 1 Audel, Publishers 111	Lake Chemical Co. Logan Engineering Co. Lynch Mfg. Corp.
Auto-Diesel Piston Ring Co., The	Marsh Corp., Jas. P
Bacharach Industrial Instrument Co. 104 Betz Corp. 12 Black, Sivalis & Bryson, Inc. 105 Blythe Co., H. W. 102	Modern Design Products Co. 9 Modern Gas Co., Inc. 10 Modern Technical Book Co. 11 Mueller Brass Co. 4 and
Bonney Forge & Tool Works. Back Cover Brown Electric Co. 85 Brunner Mfg. Co. 21	New Duty
Chase Refrigeration Supply Co	Peerles of America, Inc. Penn Electric Switch Co. Ranco, Inc.
Circle Valve Repair	Refrigeration Control Service. 10 Refrigeration Service, Inc. 11 Rempe Co
Davison Chemical Corp Inside Back Cover Day & Night Mfg. Co. (Refrigeration Div.) 100 Detroit Lubricator Co 2 and 3	Sanitary Refrigerator Co
Ebco Manufacturing Co., The 22 Edison Cooling Corp. 104 Electric Power Equipment Corp. 81 Electrimatic 103	Shank Co., Cyrus. Skasol Corp. Sporlan Valve Co. Standard Refrigeration Co. Standard Dickerson Corp., The 11
Fine Products Co	Superior Valve & Fittings Co
G & E Equipment Supply Co. 111 General Controls. 26 Grunow Authorized Service, Inc. 107	Tecumseh Products Co
Hasco, Inc. 98 Heat-X-Changer Co., Inc. 95 Henry Valve Co. 9 Highside Chemicals Co. 8	United Speedometer Repair Co
Ideal Industries, Inc	Virginia Smelting Co
Jamison Cold Storage Door Co	Western Thermal Equipment Co

LEADERS FOR 50 YEARS PAST



BRANCHES IN PRINCIPAL CITIES



. 63 . 14 .107 . 73 . 99 . 77 .111 . 93

nd 5



Make Jobs Easier, Faster, Safe

Every tool in the complete Bonney Line is designed to simplify the job of tightening and loosening bolts and nuts.

Bonney Tools make jobs easier because they are designed right... they help you get jobs done faster because they are accurately machined for a perfect fit, and they are safer to use because they are made from fine alloy steels and are

"precision" heat-treate

If you are one of the mar mechanics who has bee using Bonney Tools, you be glad to know that you co again get more of them fro your nearest Bonney To Jobber or Distributor. If yo haven't tried these easis faster, safer-to-use Bonney Tools, ask your Bonney To Jobber or Distributor to sho them to you. Or write for the new Bonney Tool Catalo

BONNEY FORGE & TOOL WORKS

717 N. MEADOW ST., ALLENTOWN, PA.

